**U.S. Environmental Protection Agency**
**Region 10**

# RESPONSE TO COMMENTS

**Hecla Mining Company - Grouse Creek Unit**
**NPDES Permit No.: ID-002646-8**

**December 11, 2001**

**TABLE OF CONTENTS**

## I. INTRODUCTION

A draft National Pollutant Discharge Elimination System (NPDES) Permit for the Grouse Creek Mine, operated by Hecla Mining Company (Hecla), was issued for public notice on November 24, 1999. The Public Notice initiated a 45-day public comment period. The comment period was extended by 30-days after a request for extension from Hecla. The comment period ended on February 9, 2000.

EPA received comments from the following:

- Boulder-White Clouds Council and Idaho Conservation League (February 7, 2000 letter from Lynne Stone, Director, Boulder-White Clouds Council and Dallas Gudgell, Conservation Associate, Idaho Conservation League)

- Hecla Mining Company (February 8, 2000 letter from Kevin J. Beaton, Stoel Rives)

- E.D. Moon (December 12, 1999 letter)

- U.S. Department of Agriculture, U.S. Forest Service (January 3, 2000 and January 20, 2000 letters from Rene' M. Mabe, District Ranger, Yankee Fork Ranger District)

Information considered by EPA in establishing final permit conditions include public comments as well as information from actions by other federal agencies and the State of Idaho. The following summarizes the actions and new information that influenced finalization of the permit, the comments received, and EPA's responses to the comments.

Appendix E contains a shaded-strikeout version of the final permit that demonstrates changes between the draft permit and the final permit (additions are shaded and deletions are in strikeout).

## II. ACTIONS AND NEW INFORMATION AFTER THE PUBLIC COMMENT PERIOD

### A. Updated Effluent and Receiving Water Chemistry Data

Since the time that the draft permit effluent limits were calculated, additional effluent and receiving water data has been collected. For example, Hecla submitted additional upstream receiving water data (Hecla 2001b). This additional data has been added to the data base used to calculate the water quality-based effluent limits (WQBELs) in the final permit. Appendix C describes the WQBEL calculations for the final permit and identifies where new data has been used.

## B. State of Idaho Clean Water Act 401 Certification

The State of Idaho Department of Environmental Quality (IDEQ) issued a Clean Water Act (CWA) 401 certification of the NPDES permit dated October 3, 2000 (IDEQ 2000). IDEQ issued an amendment to the 401 certification dated December 4, 2001 (IDEQ 2001). Appendix B includes a copy of the original certification and amendment. The original certification and amendment are, hereafter, referred to collectively as the certification. The following summarizes the 401 certification requirements, which were incorporated into the final permit:

Mixing Zones: IDEQ authorized mixing zones shown in the following table for Outfall 002. These mixing zones were used to develop water quality-based effluent limits (WQBELs) for the final permit (see Table 1 of the final permit). Appendix C demonstrates how the WQBELs were calculated for the final permit.

Table 1: Mixing Zones for Outfall 002

| Parameter | Mixing Zone |
|---|---|
| Cadmium | 75 % |
| Chromium | 100 % |
| Copper | 50% |
| Lead | 100 % |
| Mercury | 100 % |
| Silver | 25 % |
| Zinc | 50 % |
| WAD Cyanide | 100 % |
| WET | 100 % |
| Recreational Criteria | 100 % |

Bioaccumulation Study: IDEQ required that Hecla conduct a bioaccumulation study during the mercury compliance schedule (i.e., for the first three years of the permit). The bioaccumulation requirements include the following:

- That Hecla annually determine the level of mercury accumulated in fish present in Jordan Creek upstream and downstream of outfall 002.

- That Hecla collect sculpins as the test species (unless a fish collection permit is denied, in which case Hecla must submit alternative methods to acquire information germane to the protection of resident species from mercury accumulation).

- If the tissue concentrations of mercury downstream are statistically significantly higher than the concentrations upstream, then Hecla must notify IDEQ within 10 days of receiving the results.

- If the level of mercury present in fish tissue exceeds 0.3 mg mercury/kg fresh weight, the certification requires that Hecla notify IDEQ within 7 days, investigate the sources of mercury and take steps to reduce mercury discharges, and report on the results of the source identification and steps taken to reduce mercury concentrations (within 60 days of receipt of results from the lab).

- An annual report of all monitoring, including all data summarized in electronic form is due by April 1 of each year.

- The certification allowed Hecla to propose that the bioaccumulation study be conducted in conjunction with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Administrative Order on Consent (AOC).

The mercury bioaccumulation study requirements of the certification were incorporated into the final permit Part I.E. The certification also included recommendations on data interpretation and further investigations and actions. Since these items were worded as recommendations, rather than requirements, they were referenced in the permit as such, rather than directly incorporated.

Toxicity Testing: The certification specified whole effluent toxicity (WET) testing requirements to demonstrate compliance with the Idaho narrative water quality standards for toxicity. The requirements included:

- Annual acute bioassays using rainbow trout (salmonid 96-hour early life stage test) in April through June concurrent with ambient chemical sampling. Since the ambient monitoring occurs in April and July, the final permit requires that acute tests be conducted in April (see final permit Part I.B.2.). The draft permit did not require acute testing. The addition of acute testing to the final permit resulted in changes to the organization of Part I.B. (WET Testing Requirements) of the permit, including the addition of parts I.B.2. and I.B.4.a. and revision to the Quality Assurance (parts I.B.5.a. and b. of the final permit), Accelerated Testing (Part I.B.6.), and Toxicity Reduction Evaluation and Toxicity Identification Evaluation (Part I.B.7.a.) sections.

- Quarterly chronic bioassays using fathead minnow and/or *Ceriodaphnia* concurrent with ambient chemical sampling. Since ambient chemical sampling occurs in January, April, July, and October, these are the months when chronic WET testing is required (see final permit Part I.B.3.). The certification also stated that if the *Ceriodaphnia* test is the most sensitive test, then the fathead minnow test should still be conducted annually. Since this was worded as a recommendation and it is inconsistent with EPA guidance that, after the

initial screening period, only the most sensitive species need be tested, this was not incorporated as a final permit requirement. However, the permittee may choose to conduct the fathead minnow test annually, in which case the results must be submitted to EPA and IDEQ according to Part III.D. of the permit.

**S** The certification stated that use of the *Selenastrum* species is not appropriate. Therefore, this species was removed from the final permit chronic WET testing requirements.

**S** Target endpoints of no toxicity of 100% effluent at 2-hours and no toxicity at 33% effluent at 96-hours for the acute testing. This defined acute toxicity (see Part I.B.2.d. of the final permit) and the acute toxicity triggers (Part I.B.4.a.) and influenced the dilution series to be tested (Part I.B.5.a.i.).

**S** Target endpoint of $IC_{25}$ less than the target instream waste concentration for the chronic testing. The draft permit specified that WET tests be reported in terms of the NOEC. This was replaced with the $IC_{25}$ in the final permit (Part I.B.3.d.). The target instream waste concentrations, also called the receiving water concentrations (RWC), are the concentrations that correspond to the WET permit limits (Part I.B.4.a.). The certification stated that measurement endpoints should also be reported as the NOEC. This is consistent with the permit requirement that the report of results include all relevant information outlined in Section 10 of the chronic methods manual.

**S** The certification required that testing programs include a geometric dilution series with a least 6 dilutions ranging from 100% effluent to 0% effluent, where one dilution approximates the target concentration. The target dilution value should be bracketed by other dilutions in the series. This was included in part I.B.5.a. of the final permit.

**S** The certification required that the content of WET test reports include: flows collected at the time of sampling, instream waste concentrations, and summary statistics showing whether measured toxicity is above or below actual dilution. This was included in Part I.8.c. of the final permit. The certification also contained recommendations on additional content of WET test reports (e.g., the inclusion of summary plots). Since this item was worded as a recommendation, rather than a requirement, it was referenced in the final permit as such (Part I.B.8.c.).

**S** The certification provided recommendations for toxicity test failure rates and hazard decisions. The certification recommended that toxicity test failure rates > 20% would trigger toxicity identification and reduction procedures. This was already embodied in the accelerated testing permit language (see also response to Hecla comment 31).

**S** The certification recommended that dilution waters have similar hardness and alkalinity to receiving waters and preferably upstream receiving water would be used for dilution. Per the methods manuals (EPA 1993a and EPA 1994b), the permit requires that dilution

water should be receiving water or lab water as appropriate as described in the methods manual (Part I.B.5.c.iii.).

Biomonitoring: IDEQ required that Hecla annually conduct biomonitoring. The biomonitoring requirements include (see Part I.E. of the final permit):

- Biomonitoring of macroinverteberates and fish above and below Outfall 002, after seasonal high flow conditions have receded but before annual low flow conditions (in July or August).

- If a fish collection permit is denied, Hecla must submit alternative methods to acquire the necessary biomonitoring information.

- An annual report of all monitoring, including all data summarized in electronic form is due by April 1 of each year.

- The certification allowed Hecla to conduct biomonitoring pursuant to the Comprehensive Environmental Water Quality Monitoring Plan or Grouse Creek Task Force recommendations or in conjunction with the CERCLA AOC or Engineering Evaluation Cost Analysis (EECA).

Compliance Schedule: IDEQ authorized a compliance schedule for the copper (≥ 30 cfs flow tier), mercury, zinc (≥ 30 cfs flow tier), WET, and dilution ratio effluent limits that included the following requirements:

- The certification requited that Hecla comply with the dilution ratio limit by October 1, 2002 and with the copper, mercury, zinc, and WET limits within three years of the issuance date of the permit.

- Until compliance is achieved, the certification established the following interim limitations (the interim limits were based treatment plant performance over the last year):

Table 2: Interim Effluent Limits

| Parameter | Maximum Daily Limit (ug/l) | Average Monthly Limit (ug/l) |
|---|---|---|
| Copper (≥ 30 cfs flow tier) | 35 | 14 |
| Mercury | 0.2 | 0.2 |
| Zinc (≥ 30 cfs flow tier) | 200 | 100 |
| WET | no interim limits; but chronic toxicity triggers established | |
| Dilution Ratio | no interim limits | |

- The certification required that Hecla submit a compliance schedule plan that includes a schedule for long-term water treatment, plans for future discharges from outfall 002, and Hecla's plan for attaining compliance with the NPDES permit beyond the three year compliance schedule. The plan must be submitted by October 1, 2002.

- By April 1 of each year, Hecla must also report annually on progress made to meet the compliance schedule.

The compliance schedule requirements are included in Part I.A.5. of the final permit. Because a compliance schedule is now included in the permit, Part III.J. was added to the final permit. Part III.J. is based on 40 CFR 122.41(l)(5) which requires that reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule be submitted no later than 14 days following each schedule date.

Reopener for Dilution Ratio Limit: IDEQ requested that a reopener clause be included in the permit to allow EPA to incorporate a revised dilution ratio (the dilution ratio may need to be revised depending upon the outcome of the CERCLA EECA). The permit language at Part V.L. already includes a reopener. The final permit language was revised to include "results of the CERCLA EECA" as an example of new information that may warrant a modification.

## C. Endangered Species Act (ESA) Consultation

As discussed in the Fact Sheet, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) identified a number of threatened and endangered (T&E) species that may inhabit the area affected by the Outfall 002 discharge from the Grouse Creek Mine (see Table 3). In accordance with the ESA, EPA is currently engaged in formal consultation with USFWS and NMFS (referred to collectively as the Services) regarding effects of the final NPDES permit on the T&E species. On February 6, 2001, EPA requested initiation of formal consultation and submitted a Biological Evaluation (BE) to the Services. In the BE (EPA 2001), EPA made the following determinations:

Table 3: Conclusions of the Biological Evaluation (EPA 2001)

| Species | Determination |
|---|---|
| Sockeye Salmon (*Oncorhynchus nerka*)<br>Ute ladies' tresses (*Spiranthes diluvialis*) | no effect |
| Gray wolf (*Canis lupus*)<br>Canada lynx (*Lynx canadensis*)<br>Bald eagle (*Haliaeetus leucocephalus*) | not likely to adversely affect |
| Spring/summer and fall chinook salmon (*O. tshawytscha*)<br>Steelhead (*O. mykiss*)<br>Bull trout (*Salvelinus confluentus*) | may adversely affect within the area of the mixing zones; not likely to adversely affect outside the mixing zones |

Even though EPA has determined that the permitted discharge may be likely to adversely affect some listed species, EPA believes that it is better from an environmental standpoint to have the new permit in place than to retain the older permit. This is because the effluent limits in the permit are more stringent than those in the prior permit and imposition of the new permit limits will improve water quality. The permit also contains more stringent whole effluent toxicity testing requirements, receiving water chemical monitoring, bioassessment monitoring, and bioaccumulation monitoring. The monitoring required in the permit will be used to assess the potential for adverse effects and allow adjustment of future permit conditions.

Since the current consultation time line is delaying permit reissuance, EPA decided to reissue the permit while consultation is pending. Once consultation is completed, EPA will modify the permit if EPA finds that the consultation demonstrates that different permit limits of conditions to protect listed species or critical habitat are warranted. The reopener clause in the permit (Part V.L.) has been revised to this effect.

## III. COMMENTS RECEIVED ON THE DRAFT PERMIT

### A. Boulder-White Clouds Council (BWCC) and Idaho Conservation League (ICL) Comments

The following comments were received from the BWCC and ICL in regards to the draft permit.

**BWCC/ICL Comment 1: Failure to Establish Effluent Limits**

BWCC and ICL requested that EPA seek out additional data to determine the need for effluent limits for selenium, ammonia, and nitrate/nitrite. If additional data is not available, they urge EPA to invoke the reopener clause in the permit and revise the effluent limits as sufficient data becomes available indicating a potential for water quality standards violations.

**Response:**

As discussed in the Fact Sheet, sufficient effluent data was not available to determine whether selenium and ammonia in the discharge have the reasonable potential to cause or contribute to an excursion of the water quality criteria. Therefore, effluent limits for ammonia and selenium were not developed. Effluent and receiving water monitoring for ammonia and selenium were included in the draft permit and are retained in the final permit in order to gather information to determine the need for effluent limits in the future. Nitrate/nitrite was not considered during development of the draft permit. However, effluent and receiving water monitoring for nitrate-nitrite is included in the final permit (Tables 1 and 3) to determine the need for effluent limits in the future (see also response to USFS comment 1b).

The regulations at 40 CFR 122.62 establish that any person may request a modification of the permit for more or less stringent conditions. The reopener clause in the final permit (Part V.L.) would allow reopening of the permit and establishment of a water quality-based effluent limit based upon any monitoring results or other new factors which indicate that the effluent causes, has the reasonable potential to cause, or contributes to an excursion above water quality standards.

**BWCC/ICL Comment 2: Cyanide Limit**

BWCC and ICL commented that cyanide limits should be based on total cyanide as opposed to weak acid dissociable (WAD) cyanide, since there is no consensus in the scientific community that would justify disregarding potential downstream impacts of bound cyanide on water quality.

**Response:**

Per 40 CFR 122.44(d)(1)(i), limitations must control all pollutants or pollutant parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard. The applicable cyanide standard is found in the State of Idaho water quality standards at IDAPA 58.01.02210.02.d. The State of Idaho adopted EPA's recommended numeric criteria for cyanide, but specified that cyanide be expressed as WAD. Therefore, in the draft and final permit, the effluent limits and monitoring for cyanide is based on the WAD form.

According to EPA's water quality criteria document for cyanide (*Ambient Water Quality Criteria for Cyanide - 1984*, EPA 440/5-84-028), the toxicity of cyanide to aquatic organisms is due mainly to the presence of free cyanide and those simple cyanide and cyanide complexes (e.g., metallocyanide complexes) which might release free cyanide via dissociation, photodecomposition, and hydrolysis after discharge to surface waters. The WAD cyanide method measures free cyanide, simple cyanides, and the weak-to-moderately strong cyanide complexes. The total cyanide method measures these same forms plus the strong cyanide complexes (primarily iron cyanides). The strength of these strong complexes makes it unlikely that they will be an important source of free cyanide in natural systems. Although iron cyanides are subject to photolytic decomposition, this occurs primarily at the air/water interface and in flowing waters will readily volatilize to the gaseous form. EPA's Gold Book (*Quality Criteria for Water*, EPA 440/5-86-001) stated that a measurement such as "acid soluble" (or free cyanide) would provide a more scientifically correct basis upon which to establish criteria for cyanide and the numerical criteria themselves were developed on this basis. The Gold Book also stated that the cyanide criteria may be overly protective when based on the total cyanide method. Nationally EPA accepted the use of a WAD method for wastewater analysis and compliance monitoring by promulgating method OIA-1677 as a 40 CFR 136 method.

**BWCC/ICL Comment 3: Mixing Zones - Justification for Mixing Zones**

BWCC and ICL commented in support of not applying a mixing zone for mercury and cyanide. However, they commented that mixing zones should not be allowed for the other parameters for the following reasons:

1) Mixing zones are inconsistent with the Clean Waters Act's goal of eliminating the discharge of pollutants into navigable waters and prohibiting the discharge of toxic pollutants in toxic amounts. A separate comment cites CWA Section 301(b)(C) as prohibiting mixing zones.

2) End-of-pipe standards should be applied to all persistent and bioaccumulative toxics in the effluent, (e.g., cadmium, zinc, and lead).

3) Jordan Creek is critical habitat for endangered salmon, steelhead, and bull trout and any mixing zone will adversely affect these species and other aquatic life. A separate comment from BWCC/ICL requested that EPA follow the Great Lakes region guidance that a mixing zone would not be allowed if it was likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the species critical habitat.

4) Allowing a 25% dilution for WET may not result in a discharge that is safe and is unrelated to specific hydrologic conditions of the waterbody.

5) The Idaho water quality standards prohibits mixing zones that result in "unreasonable interference with or danger to existing uses." Separate comments state that mixing should not be permitted to lower water quality to the point of impacting existing uses and the State will not be maintaining uses when it permits a chronically toxic mixing zone to exist in Jordan Creek.

**Response:**

response to reason #1: The CWA does not categorically prohibit the discharge of pollutants into receiving waters. Rather, it established the NPDES permits program to regulate point source discharges in a manner that protects the physical, chemical, and biological integrity of the nations waters. EPA interprets the CWA as allowing the use of mixing zones as long as the provisions addressing toxicity at section 101(a)(3) are met and the designated uses of the water body as a whole are protected. Section 301(b)(1)(C) of the CWA requires that NPDES permits include "any more stringent [effluent] limitation...necessary to meet water quality standards[.]" EPA's Water Quality Standards regulation allows states to adopt provisions authorizing mixing zones (40 CFR 131.13). The State of Idaho water quality standards allows for mixing zones (IDAPA 58.01.02060.) and the state has issued a CWA Section 401 certification that includes a mixing zone for Outfall 002. Therefore, since the State provides for mixing zones in its water quality standards, then inclusion of a mixing zone in the permit is fully consistent with, and meets the states water quality standards as required by CWA 301(b)(1)(C). In

addition, the NPDES regulations (40 CFR 122.44(d)(1)(ii)) specify that when determining the need for effluent limits, the permit writer is required to consider the dilution of the effluent in the receiving water. Therefore, EPA does not agree that mixing zones are inconsistent with the CWA and the state-certified mixing zones have been incorporated into development of the final effluent limits.

response to reasons #2, 4, and 5: The Fact Sheet that accompanied the draft permit provided a basis for the mixing zones used to develop the draft permit effluent limits. As discussed in Section II.B., IDEQ has since submitted a CWA Section 401 Certification that authorized mixing zones for Outfall 002. IDEQ did not prohibit mixing zones for persistent and bioaccumulative toxics and authorized a mixing zone of 100% for WET. IDEQ certified that the mixing zones will be protective of designated uses in Jordan Creek and that there is a reasonable assurance the discharge will comply with the Idaho Water Quality Standards. These mixing zones, therefore, were used to develop the effluent limits in the final permit.

response to reason #3: EPA has prepared a Biological Evaluation (BE) to determine whether or not the effluent limits (including mixing zones) will adversely affect the threatened and endangered (T&E) species or their habitat. EPA determinations are summarized in Section II.C., above. As discussed in Section II.C., ESA consultation is ongoing. At the completion of consultation, EPA will modify the permit if EPA finds that the consultation demonstrates that different permit limits or conditions (such as reduced mixing zones) to protect endangered species are warranted.

**BWCC/ICL Comment 4: Mixing Zones - Sizes**

As part of their comment questioning the application of mixing zones, BWCC and ICL questioned the size of the mixing zone. Specifically, they asked over what downstream distance the mixing zones are expected to extend.

**Response:**

IDEQs CWA Section 401 Certification authorized mixing zones based upon the receiving water volume. The certification stated that the "mixing zones provide for a zone of passage for fish based on the avoidance threshold concentrations for copper and zinc." and "According to the mixing zone models provided these percentages minimize the toxic dilution zone to, at least within a few feet of the outfall." The mixing zone models referenced were from a mixing zone analysis provided by Hecla (Hecla 2000). For the BE, EPA estimated the physical size of the mixing zones for each parameter based on Hecla's analysis. The acute mixing zones extend less than a few feet downstream from the outfall discharge for all parameters. The chronic mixing zones extend a few feet downstream for copper and zinc, up to 120 feet downstream for WAD cyanide, up to 150 feet downstream for cadmium, lead, and mercury, and greater than 250 feet downstream for WET.

**BWCC/ICL Comment 5: Monitoring Plan**

As part of their comment questioning the application of mixing zones, BWCC and ICL questioned what compliance or enforcement mechanisms can be exercised if a problem is identified based on monitoring under the Comprehensive Water Quality Monitoring Plan.

**Response:**

The draft permit required surface water monitoring in Jordan Creek and the Yankee Fork and reporting of the biomonitoring conducted pursuant to the Comprehensive Water Quality Monitoring Plan (CWQMP). Based upon the response to comments (see response to Hecla comment 28), the surface water monitoring was reduced to monitoring the stations in Jordan Creek that are directly upstream and downstream of the outfall. Based upon the IDEQ CWA 401 Certification more specific bioassessment and bioaccumulation requirements were added to the final permit (see Section II.B.). The permit allows for the surface water and bioassessment monitoring to be conducted pursuant to the CWQMP, so long as the monitoring requirements in the permit are met (see Parts I.C. and I.D. of the final permit). The specific monitoring requirements in the permit, therefore, are enforceable condition of the permit and must be adhered to regardless of other changes in the CWQMP. EPA will evaluate the results of the monitoring in determining future permit conditions.

**BWCC/ICL Comment 6: Antidegradation and Mixing Zones**

BWCC and ICL commented that mixing zones that exist through multiple permit cycles are in effect de facto reclassifications of public waters and are inconsistent with state and federal antidegradation policies. The federal Antidegradation Policy (40 CFR 131.12(a)(2)) requires any lowering of water quality to be accompanied by a finding of important economic or social need. Such an analysis has not been performed.

**Response:**

As discussed in response to comment #3, above, mixing zones are not inconsistent with federal and state regulations. In regards to antidegradation, an antidegradation demonstration is only required in those instances where there is a lowering of water quality. Since the effluent limits for metals, cyanide, and pH in the new permit are lower than the limits in the current permit and the dilution is limited to the dilution ratio used to calculate the effluent limits, subsequent loadings to Jordan Creek will be reduced. This will result in improved water quality, therefore an antidegradation analysis is not needed.

Mixing zones may or may not exist through multiple permit cycles. The State must recertify the permit (including mixing zones) for each successive permit. Therefore, the mixing zones will be reassessed prior to issuing any new permit.

**BWCC/ICL Comment 7: Tailings Impoundment Water**

BWCC and ICL were concerned with allowing Hecla to discharge tailings impoundment underdrain water from Outfall 002 since, (1) that would require the construction of two water treatment plants and (2) additional discharge of cyanide to Jordan Creek must be prohibited (since Jordan Creek is currently water quality limited in terms of cyanide and any level of discharge is a violation of the CWA).

**Response:**

response to #1: The draft permit allowed Hecla to discharge wastewater from the tailings impoundment underdrains through Outfall 002 since Hecla applied for this discharge in their NPDES permit application. Their current permit also allows Hecla to discharge underdrain wastewater. The effluent limits in the draft (and final) permit are based upon characteristics of their current discharge, including the cyanide contributed by the underdrain waters. Therefore, effluent limits were included for cyanide in the draft and final permits. The cyanide effluent limits in the new permit are much lower (21 ug/l average monthly limit and 47 ug/l maximum daily limit) than those in the current permit. Since September 2000, the concentration of cyanide in outfall 002 has been less than 5 ug/l (as report by Hecla on DMRs), therefore, Hecla can meet the new cyanide limits and modification to the treatment plant for cyanide is not needed. Modification to the treatment plant may be required to achieve the copper, mercury, zine, and WET limits, however, a three year compliance schedule is allowed to make any such modifications (see Section II.B., compliance schedule).

response to #2: When calculating effluent limits, EPA accounts for the background presence of the pollutant in the receiving water. At the time that the draft permit limits were calculated, the cyanide level in Jordan Creek upstream of the outfall exceeded the chronic aquatic life criteria of 5.2 ug/l for WAD cyanide. Therefore, the draft permit effluent limits for cyanide were based on meeting the chronic aquatic life criteria at the "end-of-pipe" (i.e., no mixing zone was allowed). Since then, the levels of WAD cyanide have decreased to less than a detection limit of 5 ug/l (see Hecla comment 5 and the response) and the State has authorized a mixing zone for WAD cyanide (see Section II.B.). Based on these factors, the WAD cyanide effluent limits were recalculated for the final permit. These calculations are provided in Appendix C.

**BWCC/ICL Comment 8: Compliance Schedule**

BWCC and ICL commented that compliance should take place as expeditiously as possible due to the on-going pollution of Jordan Creek and presence of T&E species.

**Response:**

Hecla is required to comply with the cadmium, copper (< 30 cfs flow tier), lead, silver, zinc (< 30 cfs flow tier), WAD cyanide, TSS, and pH, effluent limits immediately upon the effective date of the permit. As discussed in Section II.B., IDEQ authorized a

compliance schedule for the copper (≥ 30 cfs flow tier), mercury, zinc (≥ 30 cfs flow tier), WET, and dilution ratio effluent limits. EPA agrees and the NPDES regulations require that any schedules of compliance shall require compliance as soon as possible (40 CFR 122.47(a)(1)). The NPDES regulations also require that the compliance schedule include interim requirements and dates for their achievement. The compliance schedule time frame, interim limits, and conditions required by the State (see Section II.B.) fulfill these requirements and were incorporated into the final permit at Part I.A.5.

**BWCC/ICL Comment 9: Bonding**

BWCC and ICL assumed that Hecla will need to construct a water treatment plant to meet the new effluent limits. They questioned whether there is financial assurance that Hecla can operate the plant as long as necessary. BWCC and ICL request that EPA review the current bond and insist the next revision assures long-term compliance with permit conditions.

**Response:**

Bonding is not regulated by the NPDES permit. Performance bonds are administrated by the U.S. Forest Service. EPA agrees that bonding for long-term water treatment is important. Through its participation in the Interagency Joint Review Process, EPA will review the current bond and future revisions to determine whether adequate funds are available for operations and maintenance of the treatment system.

**B. Hecla Mining Company (Hecla) Comments**

The following comments were received from Hecla in regards to the Draft Permit.

**Hecla Comment 1: Effluent Limits Based Upon Flows**

Hecla commented that the flows used to establish effluent limits in the draft permit were not appropriate since the volume of wastewater discharged from Outfall 002 is directly proportional to the amount of flow in Jordan Creek (since most of the flow in Outfall 002 is storm water). Hecla commented that the permit limits should be based upon documented dilution ratios of effluent flow to Jordan Creek flow and they proposed that the following flow tiers be established:

November - February: minimum dilution ratio of 14:1 and hardness of 39 mg/l
March - April: minimum dilution ratio of 8:1 and hardness of 39 mg/l
May - June: minimum dilution ratio of 8:1 and hardness of 25 mg/l
July - October: minimum dilution ratio of 8:1 and hardness of 39 mg/l

In a subsequent letter dated March 8, 2000 (letter from Eileen Steilman, Environmental Manager to Patty McGrath, EPA), Hecla requested that the permit limits be recalculated using an 8:1 dilution ratio year around and varying the hardness value with the tier (i.e.,

hardness of 39 mg/l for the < 30 cfs flow tier and a hardness of 25 mg/l for the > 30 cfs flow tier).

**Response:**

EPA does recognize that the Outfall 002 effluent flow and Jordan Creek flow varies dramatically through the year. That is why two tiers of limits were included in the draft permit (for flows of < 30 cfs and ≥30 cfs in Jordan Creek). Since the ratio of effluent flow to receiving water flow is similar, EPA used the 8:1 dilution ratio (upstream receiving water flow:effluent flow) requested in Hecla's March 8 letter to recalculate the effluent limits for the final permit. The effluent limits still apply to two receiving water flow tiers, of ≥ 30 cfs (which corresponds to Jordan Creek flows during approximately May and June) and < 30 cfs (which corresponds to flows over the rest of the year), as requested in the March 8 letter.

The WQBEL calculations using the new dilution ratio are provided in Appendix C. Since the effluent limits are based on an 8:1 dilution ratio, it is important that the dilution ratio is always greater than or equal to 8:1. If the dilution ratio were to decrease, then the WQBELs would not be protective of the water quality criteria upon which they are based. Therefore, the dilution ratio is established as an effluent limit in the final permit. The final permit requires Hecla to monitor flow of the effluent continuously and flow of the receiving water daily and to report the minimum daily dilution ratio to determine compliance with the dilution ratio effluent limit (see Table 1 and paragraph I.A.4. of the final permit).

The hardness values cited in the comment are the same as those used in the draft permit calculations. The hardness values in the draft permit were based on the 5th percentile of the hardness values measured at location S-4 (downstream of Outfall 002) from 1994 through 1998. The hardness values in the final permit were recalculated based on data collected from May 1997 through May 2000. Operation of the treatment plant commenced in May 1997, therefore, data collected after May 1997 is more representative of current and expected future conditions, than the earlier data. Hardness data from S-4 for May 1997 through May 2000 resulted in 5th percentile hardness values of 25 mg/l for the ≥ 30 cfs flow tier (which is the same value as in the draft permit calculations) and 49 mg/l for the < 30 cfs flow tier (which is greater than the hardness used in the draft permit calculations). These hardness values were used to calculate the water quality criteria for the final permit WQBEL calculations (see Appendix C).

In a letter dated September 25, 2001, Hecla requested removal of the dilution ratio permit condition for the following reasons (Hecla 2001a):

- **S** The requirement is not necessary to meet water quality standards. In response, see the second paragraph, above, and response to Hecla Comment 7.

- Implementation of the permit condition would impact the tailings pond water quantity and quality and create conflict with the CERCLA action. In response, the State allowed a compliance schedule for the dilution ratio permit condition (see Section II.B.). The compliance schedule allows for completion of the CERCLA action (EECA) which will recommend water management for the tailings pond. Depending upon the results of the EECA, the dilution ratio permit condition could be modified. Note that if the dilution ratio is modified, all the WQBELs would be recalculated based on the new dilution ratio.

- The low flows in Jordan Creek are a recent development and reflect a different receiving water flow:effluent flow ratio. Hecla did not request a different dilution ratio, rather they requested that the dilution ratio condition be deleted from the permit. If the EECA and/or other future monitoring data indicate that a different dilution ratio is warranted, Hecla may submit to EPA a request to modify the permit. See the reopener clause (Part V.L. of the final permit).

**Hecla Comment 2: Mixing Zones**

Hecla commented that the mixing zones used in the draft permit were not appropriate and that the mixing zone instead should be based on 100%, as it is in the current permit. Hecla provided the following reasons: 1) the establishment of a mixing zones is purely a matter of state law**,** and 2) the biological data indicate that the current discharge has not had a negative impact to aquatic species.

**Response:**

response to #1: EPA agrees that the state is responsible for establishing mixing zones. This occurs in the CWA Section 401 certification prepared by the state. However, in the absence of a preliminary certification from the State (IDEQ elected to reserve comments until the draft permit is released for public review), EPA developed mixing zones in the draft permit. EPA developed the draft permit mixing zones based on the State of Idaho's mixing zone policy, EPA guidance, and considered the input of the Services in informal consultation under the ESA. The rationale for the mixing zones in the draft permit was discussed in the Fact Sheet.

As discussed in response to BWCC/ICL comment 6, even though the mixing zone in the current permit assumed 100% of the receiving water volume for dilution, the State has to recertify the permit (and mixing zones) for each successive permit. The State has since submitted a final CWA Section 401 certification that includes mixing zones for Outfall 002 (see Section II.B., Table 1). Some of the mixing zones allow 100% of the receiving water for dilution. These mixing zones were used to develop the WQBELs in the final permit.

response to #2: As discussed in response to BWCC/ICL comment 3, IDEQ certified

that the mixing zones will be protective of designated uses in Jordan Creek and that there is a reasonable assurance the discharge will comply with the Idaho Water Quality Standards (WQS).

**Hecla Comment 3: Acute Mixing Zones**

Hecla commented that the State water quality standards authorize a mixing zone for acute criteria within a zone of initial dilution so long as existing uses are protected, yet the draft permit eliminates acute mixing zones. Hecla commented that all biological data indicate that the current discharge has had no negative impact to aquatic species and submitted a summary biological evaluation to support this (Technical Memorandum, Summary of Biological Evaluation of Outfall 002 to Jordan Creek, Chadwick Ecological Consultants, Inc., Attachment C to Hecla's comments).

**Response:**

The State WQS provide recommendations as to the use of mixing zones. The standards themselves do not authorize mixing zones. The State authorizes mixing zones in their CWA 401 certification. As discussed in the previous comment, in the absence of any preliminary State certification, EPA established draft mixing zones. The Idaho WQS provide recommendations as to the size of chronic mixing zones (e.g., no more than 25% of the volume of stream flow). In regards to acute mixing zones, the Idaho WQS mixing zone policy states "Acute water quality criteria may be exceeded within a zone of initial dilution inside the mixing zone if approved by the Department." Since no recommended volume of stream flow is provided for the zone of initial dilution, no acute mixing zones were assumed in the draft permit. Acute mixing zones are protective of water quality when the physical conditions within the acute mixing zone bar organisms from being present for sufficient time to elicit a toxic response. Because modeling or other site-specific data was not available to make this determination, acute mixing zones were not included in the draft permit. In addition, the Services recommended no acute mixing zone to ensure no acute lethality to the listed threatened and endangered species. As discussed in Section II.B., the state has since authorized mixing zones that were used to develop the final permit limits.

**Hecla Comment 4: Average Monthly Limit Calculation**

In their comment on mixing zones, Hecla commented that the minimum average monthly limitation for any parameter should be the acute criterion if the chronic criterion is not exceeded in the receiving water when fully mixed.

**Response:**

The average monthly effluent limits were calculated according to guidance in EPA's *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001 (the TSD) (EPA 1991). The TSD presents a statistical approach for deriving water

quality-based effluent limits from water quality criteria that is consistently used by EPA in developing NPDES permit limits in Region 10. The TSD approach accounts for uncertainty associated with data variability. In fact, the TSD discourages the approach suggested in the comment (TSD, sections 5.3.1 and 5.4.2) since effluent variability is not specifically addressed and therefore compliance with an average monthly limit set at the acute criterion could lead to exceedences of the chronic wasteload allocation. Hecla provided no basis for departing from EPA guidance. The approach used to calculate average monthly effluent limits was, therefore, not revised in the final permit calculations.

**Hecla Comment 5: WAD Cyanide Mixing Zone and Background Concentration**

Hecla commented that the mixing zone for WAD cyanide is a state decision and therefore it was inappropriate to not include a mixing zone for cyanide. Elevated WAD cyanide levels were present in Jordan Creek from March 31 through September 13, 1999. Hecla installed monitoring wells and pumped the wells with the highest mass loading to the tailings pond. Since then WAD cyanide levels in Jordan Creek have dropped to levels at or below detection limits. Based upon the recent controls implemented to eliminate cyanide sources, a background concentration of zero should be used for determining the WAD cyanide limit.

**Response:**

The draft permit effluent limits for WAD cyanide were based on meeting criteria at the "end-of-pipe", i.e., no mixing zone was allowed. As discussed in the Fact Sheet, this is because concentrations upstream of Outfall 002 in Jordan Creek exceeded the WAD cyanide chronic aquatic life water quality criteria (5.2 ug/l) and Jordan Creek, therefore, had no assimilative capacity to allow for dilution. The upstream concentrations used in the draft permit were determined based on data collected from Jordan Creek monitoring location S-3 through June 1999. Since that time additional data have been collected that show that WAD cyanide has dropped to less than a detection limit of 5 ug/l. Therefore, an upstream concentration of one-half the detection limit (2.5 ug/l) was used in the final permit WQBEL calculations (see Appendix C). One-half the detection limit was used rather than zero because of the uncertainty over whether the cyanide in Jordan Creek has really dropped to zero given the past cyanide exceedences.

As discussed in Section II.B., IDEQ authorized a WAD cyanide mixing zone of 100% of the volume of the receiving water. Since the WAD cyanide concentration upstream of the outfall no longer exceeds the criteria, this mixing zone was used to develop the WAD cyanide effluent limits in the final permit (see Appendix C).

**Hecla Comment 6: Mercury Mixing Zone**

Hecla commented that not allowing a mixing zone for mercury because it is allegedly a bioaccumulative pollutant is inappropriate. The establishment of a mixing zone is a state

decision. Hecla provided technical memorandum to support their claim that there is no biological basis to justify elimination of mixing zones for mercury in Jordan Creek (Review of Issues Related to Water Quality Criteria for Mercury and Selenium, January 2000, and Issues Related to Mercury and Selenium Criteria in Jordan Creek, February 7, 2000, both by Chadwick Ecological Consultants, Inc., Attachments A-1 and A-2 to Hecla's comments).

**Response:**

As discussed in response to previous comments, in the absence of a preliminary state certification, EPA developed the mixing zones in the draft permit. No mixing zones were allowed for mercury since it has the potential to bioaccumulate. In informal ESA consultation with the Services, the USFWS recommended no mixing zones for pollutants that bioaccumulate. IDEQ has since provided a final CWA 401 Certification that authorized a mixing zone of 100% for mercury (see Section II.B.). This mixing zone volume was used to develop the final permit WQBELs for mercury. The final permit calculations are show in Appendix C.

**Hecla Comment 7: Mass Loading Limits**

Hecla provided the following comments related to the mass limits:

(1) Hecla commented that the mass limits in the draft permit are inappropriate since it is contrary to EPA policy and rules and the discharge from Outfall 002 is composed almost entirely of storm water runoff. Hecla cited 40 CFR 122.45(f) that states:

(f) *Mass limitations.* (1) All pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of mass except:
(i) For pH, temperature, radiation of other pollutants which cannot appropriately be expressed by mass;
(ii) When applicable standards and limitations are expressed in terms of other units of measurement; or
(iii) If in establishing permit limitations on a case-by-case basis under 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation (for example, discharges of TSS from certain mining operations), and permit conditions ensure that dilution will not be used as a substitute for treatment.

Hecla commented that exception (iii) applies since the volume of wastewater discharged cannot be related to a method of operation (since the discharge is primarily composed of storm water).

(2) Hecla also provided examples of where EPA recognized that mass limits are not appropriate for active ore mining facilities in EPA's development of technology-based

effluent limitation guidelines.

(3) Hecla also commented that the 1992 NPDES permit did not include mass limits and there is no requirement under Idaho's water quality standards that would require establishment of mass limits.

**Response:**

response to (1): As discussed in the Fact Sheet and in this comment from Hecla, 40 CFR 122.45(f) requires that all pollutants limited in permits shall have limitations expressed in terms of mass. The regulations provide three exceptions to this. Exception 122.45(f)(iii) cited by Hecla applies to technology-based effluent limits (40 CFR 125.3), not WQBELs. This exception therefore applies to total suspended solids (TSS), the only parameter in the draft permit that had a technology-based effluent limit expressed as mass and concentration. Therefore, the mass-based TSS limits were removed from the final permit. The effluent limits for the metals and cyanide are water quality-based, and therefore exception 122.45(f)(iii) does not apply.

response to (2): The examples provided by Hecla where EPA has stated that mass limitations were not appropriate for active mining facilities relates only to the development of technology-based effluent guidelines. EPA determined that the technology-based effluent limits be based on concentration instead of mass since correlating units of production and wastewater discharge by mines and beneficiation processes is not possible. However, this statement was related to limits established based on technology, not limits based on water quality.

response to (3): EPA agrees that the current NPDES permit does not include mass-based limits. However, this does not mean that such limits may not be included in the new permit.

EPA agrees that the Idaho WQS do not require the establishment of mass-based limits, but neither do the WQS prohibit the use of mass-based limits. EPA believes that mass-based controls are necessary to ensure compliance with WQS, i.e., to prevent the use of dilution as a means of treatment and to ensure that the flows used to establish the WQBELs are not exceeded. The concept of controlling the total mass loading to the receiving water is embodied in 40 CFR 122.45(f) and the TSD.

Mass loading may be controlled by establishing mass-based limits (lb/day), establishing effluent flow limits, and/or establishing dilution limits. In the draft permit, mass loading was controlled by establishing mass-based limits. The mass-based limits were calculated by multiplying the concentration-based limit by the maximum effluent flow that was used to develop the limit. However, as discussed in response to Hecla comment 1, the WQBELs in the final permit are based on a dilution ratio rather than the maximum effluent flow. Use of the effluent flow based upon the dilution ratio (see Page C-7 of

Appendix C) would be representative of only the time of critical dilution and would result in very stringent mass-based limits. Therefore, mass loading will instead by controlled via limiting the dilution ratio used to develop the effluent limits. Since the WQBELs were based on achieving state water quality criteria at the dilution ratio, it is critical that the dilution ratio be maintained, otherwise the discharge would not be protective of water quality standards in the receiving water. The final permit requires that the dilution ratio must not be less than 8:1. See also response to Hecla comment 1.

**Hecla Comment 8: TSS Limits**

Hecla commented that since TSS is a technology-based limits, mass loading limitations are not applicable. They also commented that the TSS effluent limitation is not applicable to inactive mine sites discharging storm water runoff.

**Response:**

As discussed in response to the previous comment, EPA agrees that the mass limits for TSS be removed.

EPA does not agree that the Grouse Creek Unit discharges only storm water and that the TSS effluent limitations are not applicable. In addition to storm water, Outfall 002 discharges drainage from the Sunbeam mine adit and, potentially, underdrain water from the tailings impoundment. EPA's regulations require NPDES permits to contain effluent limitations necessary to meet applicable technology-based requirements of Federal and State law (40 CFR 122.44(a)). The State does not have a water quality standard for TSS, therefore, the effluent limits in the draft permit were the technology-based limits. The Fact Sheet provides the basis for the technology-based limits. The technology-based limits for TSS were from the New Source Performance Standards (40 CFR 440.104) for the Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores subcategory of 40 CFR 440. As discussed in the Fact Sheet, the Part 440 guidelines define mines as "active" facilities. Even though the Grouse Creek Unit is not currently operating, the characteristics of the outfall 002 discharge (e.g., mine adit and underdrain water chemistry) are similar to those of an active mine. Therefore, EPA determined, based on best professional judgement (BPJ), that the New Source Performance Standards effluent limitation guidelines are the appropriate technology-based limits. The NPDES regulations at 40 CFR 125.3 require determination of permit conditions using BPJ in the absence of applicable guidelines. See also response to Hecla comments 64 and 78.

**Hecla Comment 9: pH**

Hecla provided the following comments in support of retaining the pH limitations in the current permit (6.0 - 9.0), instead of the pH limitation of 6.5 - 9.0 in the draft permit.

(1) Hecla commented that the lower pH limit of 6.5 is for in-stream water quality and not

intended to be a discharge standard and that EPA has failed to demonstrate why a lower effluent limitation for pH is necessary to protect the water quality of Jordan Creek.

(2) Pre-mining water quality data in the Final Environmental Impact Statement (FEIS) indicates a pH range of 6.0 - 8.5 for Jordan Creek and more recent in-stream monitoring shows measurements below 6.5 in lower Jordan Creek and the Yankee Fork.

(3) Idaho Water Quality Standards (IDAPA 16.01.02070.06) provide that natural background concentrations shall become the applicable water quality criteria, therefore Hecla should not be responsible for adjustment of pH levels that occur naturally in the drainage.

**Response:**

response to (1): As discussed in the Fact Sheet, the pH limitation was based on the most stringent of the technology-based effluent limit and water quality-based effluent limit. The technology-based effluent limit for pH is 6 - 9 standard units. The Idaho WQS specify the aquatic life criteria for pH as between 6.5 to 9.5 standard units (IDAPA 58.01.02250.01). Since IDEQ has not certified a mixing zone for pH, the pH water quality criteria is applied as an end-of-pipe effluent limit. Therefore, the lower pH limit in the draft permit was based on the water quality criteria (since it is more stringent than the technology-based lower limit).

response to (2): Hecla did not specify in their comments the specific location of the pH measurements cited as representative of in-stream water quality. According to the FEIS (Appendix E), the pre-mining pH at locations S-3 and S-4, which bracket the area around the Outfall 002 discharge ranged from 6.7 to 8.4 (monitoring from 1987 through 1991). Surface water monitoring of location S-3 upstream of Outfall 002 since the beginning of discharge (1994) through June 2000 had only two pH readings (out of 113 readings) less than 6.5. Since both the pre-mining and post-mining pH values upstream of the discharge are within the range of the criteria, adjustment of the criteria to the natural background level is not warranted.

response to (3): In addition, the provision (IDAPA 58.01.02070.06) cited in the comment states that "Where natural background conditions from natural surface or ground water sources exceed any applicable water quality criteria as determined by the Department, that background level shall become the applicable water quality criteria...Natural background shall be established according to procedures established or approved by the Department consistent with 40 CFR 131.11." IDEQ did not make a determination that natural background exceeded the water quality criteria or recommend a change to their pH water quality standard in their CWA 401 Certification.

For the reasons discussed above, the pH limits were not revised.

**Hecla Comments 10 through 24:** These comments focus on the WET requirements in the draft permit. To support their comments, Hecla provided a technical memorandum from Chadwick Ecological Consultants (Review of WET Limits - Draft NPDES Permit, Chadwick Ecological Consultants, February 8, 2000, Attachment C to Hecla Comments). Most of the points made in the technical memorandum were included in Hecla's comments regarding WET. Exceptions are noted in the individual comments (comments 20, 22, and 23).

**Hecla Comment 10: WET Reasonable Potential Analysis - Use of Highest Data Point**

Hecla criticized EPA for using only the WET test result that indicated the highest toxicity (exceeded current permit trigger) when determining reasonable potential. Hecla commented that all of the WET tests data should be considered.

**Response:**

EPA considered all the WET data available in making the reasonable potential determination for WET. As discussed in Appendix B, Section II. of the Fact Sheet, reasonable potential (the need for effluent limits) is determined by comparing the maximum projected receiving water concentration to the criteria. The maximum projected receiving water concentration is calculated by multiplying the maximum measured effluent concentration by the reasonable potential multiplier (RPM) (see equation 5 of the Fact Sheet). The following discusses how the WET data was used to determine the maximum projected receiving water concentration.

<u>determination of the maximum measured effluent concentration:</u> EPA did use the test result that demonstrated the highest toxicity as the maximum measured effluent concentration. Use of the highest value is recommended in the procedures for determining reasonable potential in the TSD. Hecla did not provide any reason to ignore the data point (i.e., that it was either not representative or of inadequate quality). Permittees should ensure that they are reporting valid, representative data (40 CFR 122.41(j)(1)). EPAs position is that valid, representative effluent data must not be ignored.

<u>determination of the RPM:</u> The RPM accounts for the variability of the data and is determined based on the coefficient of variation (CV) and the number of data points. <u>All</u> the WET effluent data collected from May of 1997 through May of 1999 was used to determine the WET CV and RPM in the draft permit (see Table B-4 of the Fact Sheet). Additional WET data reported through June 2000 was used to determine the WET CV and RPM in the final permit calculations (see Table C-3 of Appendix C).

**Hecla Comment 11: WET Reasonable Potential Analysis and Need for WET Limits - Use of Biological Monitoring Data**

Hecla commented that the reasonable potential analysis should consider the instream biotic monitoring data. Hecla submitted a biological evaluation (Summary of Biological

Evaluation of Outfall 002 to Jordan Creek, Chadwick Ecological Consultants, Attachment C to Hecla Comments) to support their comment that biotic monitoring shows that the discharge from Outfall 002 has not had any negative impact to the aquatic biota of Jordan Creek.

**Response:**

When setting water quality-based limits in NPDES permitting, EPA uses the principle of "independent application" of water quality standards. EPA believes that requiring independent consideration of chemical-specific, WET, and biological assessments is grounded in the requirements of 40 CFR 122.44(d)(1), which requires, among other things, that the permitting authority (1) establish chemical-specific permit limits where a discharge has the reasonable potential to cause or contribute to a violation of a numeric water quality criterion and (2) establish a WET limit where a discharge has the reasonable potential to cause or contribute to an exceedance of a numeric WET criterion. Under these provisions, if reasonable potential is found with regard to either of these aspects of standards, then a corresponding permit limit is required. There is no indication in the language of this provision that one type or information (e.g., a biological assessment) can be used to negate a reasonable potential finding based on another type of information (e.g., a WET analysis).

The TSD discusses the concept of "independent application" in detail. In summary, the TSD states that it is EPA's position that the concept of "independent application" be applied to water quality-based situations. Since each assessment method (chemical-specific, whole effluent, and bioassessment) has unique as well as overlapping attributes, sensitivities, and program applications, no single approach for detecting impact should be considered uniformly superior to any other approach. For example, the inability to detect receiving water impacts using a biosurvey alone is insufficient evident to waive or relax a permit limit established using either of the other methods. The most protective results from each assessment conducted should be used in the effluent characterization process. The results of one assessment technique should not be used to contradict or overrule the results of the other(s). The principal of independent applicability is discussed in more detail in the TSD, EPA 1994a, and EPA 1997a.

Based on the principle of "independent application", EPA disagrees that Hecla's existing biomonitoring program eliminates the need for WET limits. Some advantages of WET testing include: the toxicity of effluent is measured directly for the species tested; the aggregate toxicity of all constituents in a complex effluent is measured, and toxic effect can be limited by limiting one parameter, i.e., WET; and ecological impacts can be predicted before they occur. The bioassessment approach is limited in that: bioassessment conducted at critical low flow conditions can be difficult to accomplish; cause of impairment may not be assigned readily to the discharge; and, the methods detect problems after they have occurred and the impacts may not yet have occurred.

**Hecla Comment 12: WET Limits - Need for WET Limits**

Hecla commented in detail that WET limits and monitoring should not be included in the permit. Following is a summary of their reasons to support this comment: (1) EPA is currently developing guidance to clarify how permit writers should take variability of WET test results into account as a result of settlement litigation challenging WET testing (*Edison Electric Institute et al v. EPA*). Until this is resolved, it is inappropriate to establish WET limits; (2) There is no evidence of an impact to aquatic species in Jordan Creek due to the discharge, therefore, Hecla disagreed that the state narrative standard for toxic substances (IDAPA 16.01.02.200.02) dictates WET limits.; (3) Hecla cited 40CFR 122.44(d)(1)(v) stating that the imposition of more stringent effluent limits eliminates the necessity for establishing WET limits; (4) WET limits and testing is not reasonable for a non-operating mine site; and (5) the quality of the discharge will be improved under the new permit.

**Response:**

response to (1): Under the settlement cited, EPA will prepare and distribute guidance on how to take analytical variability into account in determining the need for and in the derivation of effluent limitations for WET. The guidance was released in June 2000 (*Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program*, EPA 833-R-00-003, June 2000). This variability guidance reaffirms the TSD approach used to determine reasonable potential and develop effluent limits for WET (which EPA followed in developing the WET limits for Outfall 002). A major conclusion of the guidance is that TSD approach appropriately accounts for both effluent variability and method variability. The variability guidance recommends that the statistical approach as described in the TSD be implemented. The variability guidance also recommends that point estimates be used to calculate the CV that is used in the TSD statistical methodology. The results of the effluent WET tests conducted by Hecla reported results in terms of both the no observed effect concentration (NOEC), which is an endpoint determined from hypothesis testing, and the inhibition concentration ($IC_{25}$), which is a point estimate. The NOEC values were used to calculate the CV for the draft permit WET calculations. Based on the variability guidance, the $IC_{25}$ values were used to calculate the CV for the final permit calculations. Both approaches resulted in a CV of 0.8 (see Appendix C). Therefore, implementation of the variability guidance impacted the calculation of the CV (although the final result was the same), but did not impact the TSD procedures that were used to determine the WET effluent limitations in the final permit.

response to (2): As discussed in response to comment 11, the in-stream biological monitoring data does not negate the need for WET limits. Nor does the biological data change the intent of the State narrative standard for toxic substances. Where a numeric criterion has not been adopted, EPA has the authority to interpret the State narrative criterion for water quality in order to establish the appropriate effluent limitations,

including any necessary toxicity limitations. EPA's interpretation of the States's narrative standard for toxicity is consistent with EPA's application of that standard in other permits it has developed and which have been certified by the State of Idaho. In addition, IDEQ did not questioned Region 10's interpretation of their narrative standard for toxicity in this permit and certified additional WET testing requirements (see Section II.B.).

response to (3): Hecla cited 40CFR 122.44(d)(1)(v) which states that WET limits are not necessary "where the permitting authority demonstrates in the fact sheet or statement of basis of the NPDES permit ... that chemical-specific limits for the effluent are sufficient to attain and maintain applicable numeric and narrative State water quality standards." The Fact Sheet for the Grouse Creek Mine permit did not contain such a demonstration. To make this determination, the TSD (Section 3.3.7) recommends that the discharger conduct a toxicity identification evaluation to identify the causative agents(s) in the effluent. Hecla has not submitted a toxicity identification evaluation to support this comment. Because the specific toxicants that contribute to the WET of the discharge have not been identified, it is unknown if the chemical-specific limits themselves will control WET. For example, flocculant or other chemicals used in the treatment plant are not subject to a chemical-specific limits and may contribute to WET.

response to (4): The WET provisions in the NPDES regulations apply to all facilities regardless of the cause of toxicity or the operating status of the discharger.

response to (5): EPA agrees that the lower effluent limits for the individual pollutants will improve the quality of the discharge and lower the toxicity. However, the extent to which WET will be reduced is unknown, therefore WET limits are included in the final permit. The WET monitoring will be used to determine the need to revise or retain the effluent limits in the next permit and it may be that the improved effluent quality will result in WET data that indicates no reasonable potential.

**Hecla Comment 13: Expression of WET Limits**

Hecla questioned how the toxicity units (TUs) were derived and the basis for the standards of 1 and 0.3, for chronic and acute toxicity, respectively.

**Response:**

Toxic units (TUs) are defined in the TSD as the reciprocal of the effect concentration times 100, where the effect concentration is expressed as a percentage of whole effluent. Therefore,

acute toxicity units ($TU_a$) = $100/LC_{50}$
chronic toxicity units ($TU_c$) = $100/EC_p$

EPA uses the $LC_{50}$ (the effluent concentration that is lethal to 50% of the test organisms) to calculate $TU_a$ unless an alternate effect concentration is certified by the State. As

discussed in Section II.B., in their CWA certification, IDEQ required that acute toxicity be reported in terms of the NOEC (no observed effect concentration), therefore the final permit requires that $TU_a$ be reported in terms of the NOEC.

The $EC_p$ is a point estimate of the effluent concentration that would cause an observable adverse effect in a given percent of the test organisms. EPA uses the NOEC to calculate $TU_c$ unless the $IC_{25}$ (effluent concentration that would cause a 25 percent reduction in a non-lethal biological measurement) is certified by the State for compliance with their toxicity standard. EPA used the NOEC to determine reasonable potential and develop the draft permit WET effluent limits and $TU_c$ was defined in the draft permit as 100/NOEC. In response to the IDEQ certification, the $IC_{25}$ was used to determine reasonable potential and develop effluent limits in the final permit and $TU_c$ was defined as $100/IC_{25}$ (see response to Hecla comment 23).

Toxicity units were defined to avoid the confusion that tends to accompany inverse relationships (so that it is clear that an increase in TU represents an increase in toxicity). The TSD provides a detailed explanation and references for the derivation of toxicity units.

The State of Idaho's water quality criteria for toxic substances states that surface waters shall be free from toxic substances in concentrations that impair designated beneficial uses (IDAPA 58.01.02200.02). In the absence of a numerical criteria for toxicity, EPA provides recommendations on methods for developing acute and chronic WET criteria from State narrative water quality criteria. In the TSD, EPA recommends that a State's narrative criterion be interpreted as 0.3 $TU_a$ (acute criterion) and 1.0 $TU_c$ (chronic criterion). The TSD provides detailed explanation and references for the basis of the numeric WET criteria.

**Hecla Comment 14: Acute WET Criterion - Expressed as End of Pipe**

Hecla questioned why the acute criterion is applied as an end-of-pipe limit.

**Response:**

See the response to Hecla comment 3 which discussed the rationale for not incorporating mixing zones into the effluent limit calculations for all the acute criteria (including the WET acute criterion). As discussed in the response, the State has since submitted a CWA Section 401 Certification which authorizes mixing zones that were used to develop the final permit effluent limits. The state authorized a WET mixing zone of 100% of the volume of Jordan Creek which was used to calculate the final WET limits (see Appendix C).

**Hecla Comment 15: WET Monitoring - Compliance with Effluent Limits**

Hecla questioned how the quarterly chronic WET testing is used to calculate monthly average and daily maximum TUs for compliance.

**Response:**

Federal regulations at 40 CFR 122.45(d)(1) require that permit effluent limitations be expressed, unless impracticable, as maximum daily and average monthly discharge limitations (for all dischargers other than publically owned treatment works). This requirement does not depend upon the monitoring frequency specified in the permit. Therefore, maximum daily and average monthly limits were established for WET, even though monitoring is only on a quarterly basis. For quarterly monitoring, the effluent WET must comply with both the average monthly and maximum daily effluent limit. If Hecla monitors effluent WET more frequently, then these data must be included in the calculation and reporting of average monthly and maximum daily concentrations (see Part III.D. of the draft and final permit).

**Hecla Comment 16: WET Testing - Use of Resident Species**

Hecla commented that since resident species are not used in the toxicity testing, exceedance of the WET permit limits does not mean that there are toxic substances in concentrations that impair designated uses and it is not clear that the State regulations would require WET limits.

**Response:**

The NPDES regulations at 40 CFR 122.41(j)(4) require that monitoring must be conducted according to test procedures approved under 40 CFR 136. The approved test procedures for WET utilize standard laboratory species, not resident species. Pursuant to 40 CFR 136.5, Hecla may apply for approval of alternate test methods (using resident species, for example).

The use of standard laboratory species in toxicity tests is consistent with EPA's TSD, national policies regarding WET, and the various EPA toxicity test protocols, which were promulgated as Part 136 NPDES methods. The species recommended by EPA for effluent toxicity tests in the NPDES program were selected to represent a "performance standard" or indicator of appropriate sensitivity to toxicity for a given phylogenetic category. Therefore, to obtain authorization to use a species other than the recommended species, the permittee would have to develop a protocol to culture the organism and to assess intra- and inter-laboratory variability and demonstrate that the proposed test species is at least as sensitive as the recommended test species for that phylogenetic category. Such testing is potentially more costly, more difficult, and subject to more variability (disease, age, etc.) than standardized testing. The TSD provides more information substantiating the use of standard laboratory species.

The Idaho WQS do not designate any specific species that must be used in WET tests. However, the IDEQ CWA Section 401 Certification included specific conditions for characterizing WET, including toxicity testing with non-resident species (fathead minnow, and *Ceriodaphnia dubia*). See Section II.B., above.

Based on the above discussion, the non-resident species designated for testing in the draft permit (fathead minnow and *Ceriodaphnia dubia*) are retained in the final permit. As discussed in Section II.B., toxicity testing with the *Selenastrum* was removed from the final permit and toxicity testing with rainbow trout was added to the permit in response to the IDEQ CWA Section 401 Certification.

**Hecla Comment 17: WET Testing - Receiving Water**

Previous testing on the receiving water has shown that it is approximately the same toxicity as 100% effluent. Hecla asks what does this say about the utility of WET tests for this discharge?

**Response:**

Hecla did not provide the toxicity test information (toxicity test results, sample location, date of sample collection, etc.) on the receiving water to support this claim. For example, if the receiving water toxicity was tested during the cyanide exceedences in Jordan Creek noted in Hecla comment 5, this may not be truly representative of receiving water toxicity. However, EPA agrees that receiving water toxicity is appropriate to consider in WET testing That is why paragraph I.B.2.c.iii. of the draft permit (which is paragraph I.B.5.c.iii. of the final permit) allows site receiving water to be used to dilute effluent subject to WET tests.

**Hecla Comment 18: WET Testing - Rescreening**

*S. capricornum* was identified as the most sensitive species in previous WET testing. Hecla commented that requiring rescreening of three test species is not justified.

**Response:**

WET monitoring in the draft permit was developed consistent with guidance from the TSD and regional guidance (EPA Regions 9 and 10 1996). Per the TSD, at least three species representing three families should be used to assess WET toxicity. The draft permit specified that after the first three sets of toxicity tests, using all three species, only the most sensitive species needs to be used for future WET monitoring. Because changes in an effluent can change the relative sensitivity of the WET test species, the species should be rescreened at appropriate intervals. Achievement of the new effluent limits will change the effluent quality and potentially the most sensitive species, therefore rescreening must occur with implementation of the new effluent limits.

IDEQ certified that the use of the *Selenastrum* species was not appropriate to evaluate compliance with narrative water quality standards. The requirement to test this species was removed from the final permit. For this reason also, rescreening is required.

**Hecla Comment 19: WET Testing - Dilution Series**

Hecla questioned how the dilution brackets were determined. Hecla suggested that the dilution brackets be from 4.8% (21:1) to 12.5% (8:1), which represents actual dilution in Jordan Creek.

**Response:**

The draft permit required that the dilution series bracket the WET effluent limits. The effluent limits for the < 30 cfs flow tier were a maximum daily of 2.2 $TU_c$ and an average monthly limit of 1.4 $TU_c$. These represent effluent concentrations of 45 percent (100/2.2) and 77 percent (100/1.4) effluent, respectively. Similar calculations were performed for the ≥ 30 cfs dilution series.

As discussed in Section II. and previous comments, the effluent limits (including WET limits) were recalculated in the final permit. The new WET limits are a maximum daily of 16 $TU_c$ and an average monthly limit of 9.8 $TU_c$ for both receiving water flow tiers. These limits represent effluent dilutions of 6.3% (100/16) and 11% (100/9.8), respectively. These new dilutions replace the draft permit dilutions in Part I.B.5.a.iii. of the final permit.

The dilutions are not the same as the 8:1 dilution cited in the comment. This is because the 8:1 dilution was based on upstream flow divided by receiving water flow, whereas the dilution for the toxicity tests is based upon downstream flow consistent with the effluent limit calculations.

**Hecla Comment 20: WET TRE - Need for Initial Investigation TRE Workplan**

Hecla commented (in the Attachment B, Chadwick memo), that preparation of a TRE workplan prior to identification of a toxicity problem is premature as any future work plan would have to be modified to suit the specific needs of the effluent in question. Therefore, this requirement is unnecessary.

**Response:**

EPA agrees that preparation of the Initial Investigation TRE Workplan prior to identification of toxicity is not necessary as a permit requirement. Therefore, this requirement (Part I.B.3. of the draft permit) has been removed from the final permit. However, EPA believes that the permittee should have the option to perform an initial investigation upon the first detection of toxicity, prior to (or instead of) conducting a TRE. Therefore, a provision has been added to the Accelerated Testing section of the

final permit that allows the permittee to demonstrate, through an initial investigation, that if the cause of a WET exceedence is known (for example, a plant upset or lab error) and corrective actions have been implemented, only one accelerated WET test is necessary and if the permit trigger or limit is not exceeded in this test, then no additional accelerated testing is necessary (see Part I.B.6.d.). See also the response to comment 22, below.

**Hecla Comment 21: WET TIE/TRE - Use Actual Dilutions**

Hecla commented that the permit sets forth ambiguous criteria for the initiation of a TIE/TRE since the permit limits are based on dilutions that are not representative of actual dilution of the effluent into the receiving water. Hecla suggested that the actual receiving water and effluent flows be used to determine if initiation of confirmatory testing is necessary.

**Response:**

Following national and Region 10 guidance, the draft permit required that accelerated WET testing be initiated upon exceedance of a WET permit limit. Depending upon the results of the accelerated testing, a TRE and TIE may be initiated (see response to comment 22, below).

EPA agrees that the WET limits in the permit might not be based on the actual dilution that occurs at the time of monitoring. This is true for all of the parameters that have WQBELs. The WQBELs were calculated based on the critical receiving water and effluent flow conditions. Monitoring results must be compared to the WQBELs to ensure that water quality is protected during critical conditions, even if the sample that is tested is not collected during a critical flow condition. For the WET testing, in order to ensure that water quality is protected during critical conditions, the dilutions tested must be based on the critical conditions. Since WET monitoring occurs only quarterly, use of the actual dilution may not be representative of critical low flow conditions and the critical dilution. Therefore, the dilutions in the final permit were not revised to reflect actual conditions. In response to the IDEQ 401 certification, it is required that actual dilutions be reported for comparison.

**Hecla Comment 22: WET TIE/TRE - Pattern of Toxicity to Initiate a TRE/TIE**

Hecla commented (in the Attachment B, Chadwick memo), that the criteria for initiation of a TRE/TIE are unclear. It is not clear if exceedence of a WET limit would require implementation of a TRE/TIE immediately, or only after accelerated testing has been initiated and that testing found an exceedence of a WET parameter. Hecla commented that a pattern of toxicity should first be established through repeated confirmatory tests (such as 50% or more of the confirmatory tests indicate toxicity below the NOEC and $IC_{25}$) before performing a TRE/TIE.

**Response:**

In the draft permit language, accelerated testing is initiated upon exceedance of the WET limit (in the final permit, exceedence of toxicity triggers will also require accelerated monitoring). The accelerated tests are used, not to confirm toxicity, but to establish the presence of consistent toxicity. The draft permit required that up to six accelerated tests be performed. In response to this comment, the final permit has been revised to require that up to four accelerated tests be performed. If toxicity is detected in any of the accelerated tests prior to the fourth one, the remaining tests do not need to be completed before starting the TRE. This scenario is comparable to the recommendation in the TSD that a TRE should be required where toxicity is present above effluent limits more than 20 percent of the time (one out of four tests equates to more than 20 percent of the time). Part I.B.6.d. of the permit allows Hecla to perform an initial investigation (see response to comment 20) and only one accelerated test, in lieu of the four accelerated testing series. If the accelerated test following the initial investigation exceeds the trigger or limit, then a TRE is required. Since the permit language is consistent with the TSD and EPA Region 10 guidance, the permit will not be revised to allow 50% of the tests to fail before initiating a TRE.

For the use of the NOEC and $IC_{25}$ in measuring toxicity, see response to the following comment.

**Hecla Comment 23: WET Testing - Use of NOEC and $IC_{25}$**

Hecla provided discussion (in the Attachment B, Chadwick memo) of the use of the NOEC vs. the $IC_{25}$ for determining toxicity. Chadwick concluded that both measure "safe" concentrations of the effluent and the endpoints have been shown to be comparable. Therefore, a more rigorous test of the level of toxicity present in each sample should involve evaluation of the both the NOEC and $IC_{25}$.

**Response:**

The NOEC is generally used for determining chronic WET reasonable potential and limits and compliance with chronic WET limits. However, the $IC_{25}$ may be used where the State regulatory agency certifies its use. As discussed in Section II.B. and response to comment 13, the state certification required the use of the $IC_{25}$, therefore the NOEC was replaced with the $IC_{25}$ in the final permit (see Part I.B.3.d.). The certification also recommended that the NOEC be reported and the statistical tests should confirm each other. Since this language was worded as a recommendation ("should") it was not directly incorporated into the permit. As discussed in Section II.B., the requirement that the report of WET test results include information in Section 10 of the methods manual, will require reporting of the NOEC.

**Hecla Comment 24: WET Testing - Due Date for Reports**

Hecla commented that 45 days should be allowed to complete the testing and provide a report to EPA and there is no reason to submit the raw data to EPA before the data have been evaluated and a report prepared.

**Response:**

The draft permit (Part I.B.6.a. of the draft permit) required that toxicity test results be submitted with the discharge monitoring report (DMR) for the month in which the test is conducted and that the full toxicity report be submitted by the end of the month in which the DMR is submitted. Where a permit limit has not been exceeded, EPA agrees that the raw data does not need to be submitted separately from the full report. Therefore, the final permit requires that the permittee submit the results of the toxicity tests with the DMR for the month following sample collection (see Part I.B.8.a. of the final permit). Since the DMRs are not due until the 20th of the following month (see response to Hecla comment 42), this will allow up to 50 days for submittal of a report (assuming that the sample is collected at the beginning of the previous month).

The draft permit (I.B.6.b. of the draft permit) required that the results of accelerated testing be submitted with the DMR for the month in which with test was conducted and that the full report be submitted by the end of the month in which the DMR is submitted. Accelerated testing is initiated upon the exceedance of a permit limit or toxicity trigger and testing occurs biweekly. Therefore, in this situation, it is appropriate to submit the results as soon as possible, even prior to the full report. Since the DMRs are now not due until the 20th of the month following sample collection, it is appropriate to require submittal of the accelerated tests earlier. Therefore, this permit requirement has been revised to require that the results of accelerated testing be submitted with two weeks of receipt of the results from the lab and that the full report be submitted within four weeks of results from the lab (Part I.B.8.b. of the final permit). This balances the need for early reporting of the results while still tying it to the availability of the data from the lab.

**Hecla Comment 25: Effluent Flow Monitoring**

Hecla commented that daily monitoring for effluent flow (rather than continuous) should be adequate for the tiered permit limit approach.

**Response:**

The effluent limits have been recalculated to correspond to the minimum dilution ratio of 8:1. In order to ensure that this dilution ratio is maintained, the dilution ratio has been established as an effluent limit. Continuous monitoring of effluent flow is necessary to ensure that flow does not vary outside of this dilution ratio. Continuous effluent flow monitoring is therefore retained in the final permit.

**Hecla Comment 26: Cyanide Monitoring**

Hecla questioned whether the newly promulgated method OIA-1677 (64 FR 73414, December 30, 2000), which reports results as "available cyanide", may be used to monitor the effluent for compliance with the WAD cyanide limit. Hecla requested clarification in the permit or Fact Sheet that this method may be used for compliance monitoring.

**Response:**

Method OIA-1677 measures the same forms of cyanide as measured by the weak acid dissociable (WAD) method (see Response to Comments, 64 FR 73414 and the preamble to the proposed rule, 63FR 36809, July 7, 1998). According to the Response to Comments, EPA considered describing the method as WAD cyanide, but did not use this descriptor since future methods could use technologies other than weak-acid dissociation. Since Method OIA-1677 measures WAD cyanide and has been approved for use at 40 CFR 136, it may be used by Hecla for effluent monitoring and ambient water quality monitoring. The permit has been revised by adding footnotes to Table 1 (Limitations and Monitoring Requirements for Outfall 002) and Table 3 (Receiving Water Monitoring Parameters and MDLs) that state that method OIA-1677 may be used for WAD cyanide analysis.

**Hecla Comment 27: Ammonia Monitoring**

Hecla commented that monitoring for ammonia should not be required since most, if not all cyanide containing waters are expected to be discharged to the Yankee Fork after the new or modified water treatment system becomes operational. They also state that the low cyanide effluent limits will not allow for significant levels of ammonia generation.

**Response:**

The draft permit required monthly monitoring of the effluent and quarterly monitoring of the receiving waters for ammonia. Ammonia can be toxic to aquatic life and is also a nutrient that, with other forms of nitrogen, can contribute to accelerated eutrophication. The U.S. Forest Service (USFS) has noted that eutrophication appears to be a problem downstream of Outfall 002 (see USFS comment 1). Since the permit does not prohibit the discharge of cyanide containing wastewaters and ammonia is a breakdown product of cyanide (Hecla did not provide any information supporting the contention that the cyanide effluent limits will not allow for significant levels of ammonia), ammonia monitoring will be retained in the final permit.

**Hecla Comment 28: Ambient Monitoring Requirements**

Hecla commented that the specific list of surface water sampling stations should not be included in the permit. Rather, the permit should just state that the permittee shall conduct surface water monitoring at monitoring stations in Jordan Creek in accordance

with the site's Comprehensive Water Quality Monitoring Plan (CWQMP). Hecla does not want to have to modify the permit in order to remain consistent with the CWQMP. Hecla commented that the draft permit included stations S-7 and S-8 which are located on Grouse Creek and not relevant to the existing condition at the mine and that the draft permit did not include S-12 on Jordan Creek and S-13 on Washout Creek. Hecla also commented that all requirements of Section I.C. to do ambient monitoring, stream, sediment, biota, should be removed since these are already requirements under the Plan of Operations and Cyanidation Permit. In addition, Hecla expects the regulatory agency requirements for ambient monitoring to be conducted over the next few years to be flexible as closure activities proceed.

**Response:**

The ambient monitoring requirements in Part I.C. have been significantly revised as follows:

> surface water monitoring: The draft permit required surface water monitoring at 11 specific locations in Jordan Creek, Grouse Creek, and the Yankee Fork. EPA agrees that some of these stations are not relevant to the NPDES discharge. Therefore, surface water monitoring is now required only at stations S-3 and S-4 in Jordan Creek upstream and downstream of outfall 002. Monitoring requirements for the other surface water stations were removed from the permit since they do not directly relate to the NPDES discharge. Data from locations S-3 and S-4 were used to develop effluent limits. Continued monitoring of these locations is necessary to evaluate the impact of the discharge and support future permit limit derivations. The quarterly monitoring schedule in the permit was revised to require sampling in January, April, July and October, consistent with Hecla's most recent surface water monitoring plans. The final permit allows the monitoring to be conducted pursuant to the CWQMP, so long as the minimum requirements of the permit are met (e.g., sampling location, frequency, parameters, MDLs, and reporting). The minimum requirements are necessary to support future permit development. See Part I.C. of the final permit.
>
> biota and sediment monitoring: The draft permit required that Hecla submit the results of macroinvertebrate, fish, species composition, and sediment monitoring conducted pursuant to the CWQMP to EPA each year. This requirement was replaced with the more specific biomonitoring requirements contained in the IDEQ 401 Certification. The certification requirements are summarized in Section II.B., above. Since the requirements were specified in the certification of the permit, they also become permit requirements (parts I.D. and I.E. of the final permit).

Even though some of the ambient monitoring requirements in the permit may be redundant with the CWQMP, they are included in the permit since they directly relate to

the permitted discharge. Including them in the permit ensures that the monitoring will be conducted as specified in the permit. Instead of revising the permit to be consistent with the CWQMP, the applicable portions of the CWQMP may be revised consistent with the permit.

CWA section 308 provides EPA with the authority to require such monitoring: "Whenever required to carry out the objective of this chapter, including but not limited to (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition or effluent standard...(A) the Administrator shall require the owner or operator of any point source to (i) establish and maintain such records, (ii) make such reports, (iii) install, use, and maintain such monitoring equipment or methods (including where appropriate, biological monitoring methods), (iv) sample such effluents, and (v) provide such other information as he may reasonably require..."

**Hecla Comment 29: Water Quality Report Submittal Date**

Hecla commented that the deadline to submit the annual water quality report of January 31 of each year be changed to March 31. Hecla states that they cannot receive the December sample results and prepare a report in time to meet the January deadline. In addition, March 31 is the date included in the current permit.

**Response:**

The surface water monitoring report submittal date has been changed to April 1st (see Part I.C.6. of the final permit). This is consistent with the comment and the state certification requirement that other monitoring and reports (e.g., the biomonitoring and bioaccumulation study) be submitted by April 1st of each year.

**Hecla Comment 30: Bioassessment and Sediment Data Submittal Date**

Hecla suggested re-writing Section I.C.6. to remove the January 31st deadline for submittal of the results of the benthic macroinvertebrate monitoring, fish population and species composition monitoring, and sediment monitoring.

**Response**:

As discussed in response to Hecla comment 28 and in Section II.B., new biomonitoring requirements were incorporated into the permit based on the state certification. The certification required that results be submitted by April 1st . This deadline, therefore, became the final permit requirement (see Part I.D.4.).

**Hecla Comment 31: Water Quality Report Submittal to NMFS**

Hecla questioned what regulation requires submittal of the annual ambient monitoring reports to NMFS and commented that this is not appropriate as a permit condition.

**Response:**

As discussed in Appendix D of the Fact Sheet, this requirement was included in the draft permit (draft permit Part I.C.7.) in response to the August 1997 Biological Opinion issued by NMFS to the U.S. Forest Service (USFS). Reasonable and prudent measure term and condition #4 requires that the results of surface water quality monitoring required under the NPDES permit be submitted to NMFS. However, since the USFS already submits this information to NMFS, it was removed as a permit condition.

**Hecla Comment 32: Storm Water/Best Management Practices Plan**

Hecla commented that since the site storm water is covered under the Multi-Sector Storm Water General Permit, additional coverage of storm water and BMP Plan requirements are not necessary in this permit. Storm water that is currently routed through Outfall 002 is subject to the limitations specified in the permit and will be routed through water treatment and will not be subject to a BMP Plan. Also, Hecla commented that the draft permit incorporates Storm Water Pollution Prevention Plan requirements for an active facility rather than an inactive facility.

**Response:**

EPA agrees that the site storm water (except for storm water that contributes to Outfall 002) is covered under the Multi-Section Storm Water General Permit (MSGP). The Storm Water General Permit requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP). This is not the same as the BMP Plan requirements in the draft permit. The BMP plan is a management plan for the entire site, not just for the storm water components of the site. Therefore, the SWPPP required of the Storm Water General Permit cannot replace the BMP Plan requirements in the draft permit. A section was added to the BMP requirements to clarify the objectives of the BMP Plan (see final permit Part II.C.). The justification and regulatory authority for the BMP Plan was discussed in the Fact Sheet and is provided in BMP guidance (EPA 1993b).

EPA acknowledges that some components of the BMP Plan requirements in the draft permit referred directly to storm water and were more consistent with requirements for an active mine. Therefore, the BMP Plan requirements were revised as follows:

- The last two sentences of Part II.A. of the draft permit were deleted as the pollution prevention concept is now included in the objectives of final permit Part II.C. and the BMP Plan does not need to apply to storm water that is covered under the MSGP.

- As discussed above, Part II.C. was added to the final permit to clarify the objectives of the BMP Plan.

- Much of Part II.C. of the draft permit was based upon guidance for developing

storm water pollution prevention plans. This section (which is Part II.D. of the final permit) was significantly revised so that it reflects the more general guidance for developing BMP Plans (EPA 1993a).

- Part II.D. of the draft permit requiring comprehensive site compliance evaluations, was deleted as this requirement is consistent with storm water permits, but not necessarily BMP Plans.

- The annual reporting requirement contained in Part II.E. of the draft permit was deleted as this requirement is consistent with storm water permits, but not necessarily BMP Plans. Part II.E. of the permit continues to require an annual review of the BMP Plan and certification that the BMP Plan fulfills the permit requirements.

Even though the storm water provisions have been removed from the BMP Plan requirements in the final permit, Hecla may prepare one plan which address both the individual permit and general permit requirements.

**Hecla Comment 33: Total vs. Dissolved Metals - Expression of Effluent Limits**

Hecla commented that metal limitations must be in terms of dissolved metals as required by the National Toxics Rule (NTR) and state water quality standards. Hecla referenced 40 CFR 122.45(c)(1) which allows for effluent limitations to be expressed as dissolved where an applicable effluent standard or limitation is expressed as dissolved.

**Response:**

While it is EPA policy that water quality criteria for aquatic life protection be expressed as dissolved, the NPDES regulations at 40 CFR 122.45(c) require that all permit effluent limitations for metals be expressed in terms of total recoverable metals. There are three exceptions to this including the exception referenced in the comment. However, the exception referenced in the comment (40 CFR 122.45(c)(1)) is not applicable since it applies only where an "effluent standard or limitation has been promulgated under the CWA and specifies the limitation for the metal in the dissolved . . . form". The Idaho water quality criteria for metals (which refer to the NTR) are expressed as dissolved, but the criteria themselves are not an "effluent standard or limitation". Therefore, the expression of metals limitations as total recoverable is retained in the final permit.

**Hecla Comment 34: Total vs. Dissolved Metals - Definition of Dissolved**

Hecla commented that the analysis of dissolved metals does not accurately measure true dissolved metals which adds an unnecessary level of conservatism on setting effluent limits as total recoverable metals. Hecla commented that the term "dissolved" is an operational definition of "dissolved", i.e., it is based upon a filtration method rather than

the science of what truly constitutes dissolved metals. The operational dissolved method includes all matter passing a 0.45 micron filter, however, nontoxic colloidal particles also pass through a 0.45 micron filter. Hecla provided notes from a phone conversation with the USGS (Brian Kimball, USGS, April 21, 1994, Attachment D to Hecla's comments) and results of laboratory filtration and analysis (letter from Joe Costello, SVL, to Dave Holland, Hecla, July 20, 1999, Attachment D to Hecla's comments) to support their comment that the latest scientific knowledge is that dissolved must be based upon filtration through at least a 0.02 micron (and perhaps a 0.001 micron) filter. Hecla states that this scientific shortcoming in the Gold Book criteria to account for the coincidental measurement of nontoxic colloidal particles in the current "operational" definition of "dissolved" metals is significant. They further claim that the law requires that the latest scientific knowledge be used so application of criteria must be measured as the true dissolved fraction of metals in the effluent.

**Response:**

The NPDES regulations require that effluent limits be based on state water quality standards. The Idaho state water quality standards establish water quality criteria for most metals expressed as dissolved metals. The regulatory definition of dissolved metals states that "Dissolved metals are defined as those constituents which will pass through a 0.45 micron membrane filter." (see 40 CFR 136.3, Table IB, footnote 4). This filtration technique is the standard method used in criteria development, ambient sampling programs, and permitting programs under the CWA. This NPDES permit cannot change the definition for dissolved that is the basis of the water quality criteria.

EPA agrees that a part of what is measured as dissolved is particulate metal that is small enough to pass through the 0.45 micron filter, or that is adsorbed to or complexed with organic colloids and ligands. EPA does not agree that this colloidal or particulate metal is necessarily nontoxic, particularly after discharge to a receiving waters where chemical conditions are different from those in the effluent and such particulates may redissolve. The potential for dissolution of particulates upon discharge to surface waters is the main reason that EPA requires permit limits to be expressed as total recoverable metals.

**Hecla Comment 35: Total vs. Dissolved Metals - Total Recoverable Analytical Method**

Hecla commented that when EPA published the current rule at 40 CFR 122.45 at 49 FR 37998, the agency noted "The total recoverable metals method is an intermediate method which uses a weak acid treatment to dissolve readily soluble solids and filtration to remove residual solids." Hecla commented that this statement is not true since, (1) the pH of the sample method is 0.1 which is an extremely strong not weak acid; (2) the sample is subjected to temperatures that would kill all aquatic life prior to analysis; (3) the filtration step has the dissolved shortcomings discussed in the previous comment. Hecla concluded that this level of conservatism in setting total recoverable metals is not necessary, does not remotely represent actual impacts to the environment and, therefore

does not carry out the provisions of the CWA. Therefore, effluent limits should be expressed as dissolved.

**Response:**

The metals limits in the permit are established and monitored in a manner consistent with the NPDES regulations. As discussed in response to Hecla comment 33, EPA must calculate total recoverable metals limits in NPDES permits by regulation (40 CFR 122.45). The methods for monitoring in NPDES permits are also established by regulation (40 CFR 136), which includes the method described in the comment. This comment apparently refers to a statement in an EPA rulemaking (which has already been subject to public review) and not in the NPDES permit; comments on this permit cannot change the rulemaking.

**Hecla Comment 36: Method Detection Limits (MDLs) - Table 2**

Hecla commented that many of the method detection limits (MDLs) in Table 2 of the permit are below what is readily available from Hecla's outside analytical laboratories. Hecla requested that EPA clarify the analytical methods that can achieve these MDLs and provide an analysis of the reliability of the analytical methods.

**Response:**

Table 2 was included in the draft permit (Table 3 of the final permit) to insure that ambient monitoring achieves MDLs at levels lower than the water quality criteria. A list of some analytical methods that can achieve these MDLs is provided in Appendix D. EPA reviewed the MDLs in Table 3 in comparison to the water quality criteria and revised the zinc MDL from 2 ug/l to 10 ug/l. The zinc water quality criteria used to establish the zinc effluent limits ranged from 32 ug/l to 63 ug/l (see Table C-2 of Appendix C), therefore, it is acceptable to increase the MDL for zinc.

The MDLs are the key permit requirement, not specific analytical methods. This allows Hecla the flexibility to use whatever EPA-approved method is available (either currently or in the future) to achieve the effluent limits. The permittee must specify the analytical methods that will be used to achieve the required MDLs in the Quality Assurance Project Plan (QAPP), which covers all monitoring under this permit. Since the permit does not require specific analytical methods, EPA will not provide an analysis of the reliability of the methods that can achieve the MDLs. Such reliability data is available with the promulgation and description of the specific methods. The permittee is responsible for ensuring that the analytical methods that they use are reliable.

Part I.C.4. of the draft permit (which is Part I.C.5. of the final permit) allows the permittee to request different MDLs. EPA recognizes that some permittees may be unable to meet the specified MDLs due to matrix interferences. The NPDES regulations allow for establishment of site-specific MDLs in the provisions of alternative test

procedures under 40 CFR 136.4. However, the permittee must complete the EPA approval process before they can be used for compliance monitoring purposes. EPA has guidelines by which permittees may request discharge-specific MDLs: *National Guidance for the Permitting, Monitoring and Enforcement of Water Quality-Based Effluent Limitation Set Below Analytical Detection/Quantitation Levels* (OWEC, March 22, 1994), see specifically Appendix B (Guidance for Permit Writers and the Permittee on the Development and Review of Discharge-Specific Method Detection Limits) and *Guidance on Evaluation, Resolution, and Documentation of Analytical Problems Associated with Compliance Monitoring* (EPA 821-B-93-001). Hecla has not submitted information according to these guidelines to justify changes in the MDLs, therefore the MDLs were retained in the final permit (see Table 3 of the final permit). If Hecla submits information according to the guidelines and it is determined that there are matrix interferences which preclude the facility from achieving the MDL specified in the permit, the permit may be reopened and the MDLs can be modified accordingly.

**Hecla Comment 37: Use of Practical Quantification Limit**

Hecla commented that the reliability of quantification of results at these low levels is questionable at best since errors inherent in the sampling and analysis are magnified and, at times, matrix interferences will not allow achievement of low detection levels. When this is compounded with the fact that the results produced are reported as between the MDL and the Practical Quantification Limit (PQL), there is an increased uncertainty regarding what the "true" concentration really is. When the permit limitations are at very low levels that are also at the lower limits of analytical "sensitivity", false positive results are likely. When the permit limits are below the PQL for an analytical method, compliance with the permit limits should be assumed when the analytical results are below the PQL.

**Response:**

EPA agrees that compliance with WQBELs at the MDL is not appropriate. EPA Region 10 developed guidance for establishing a concentration for determining compliance with WQBELs below analytical detection levels (EPA 1996). The inability to measure to the necessary level of detection is addressed by establishing the Minimum Level (ML) as the quantification level (this is also discussed in the Fact Sheet). The ML is defined as the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specific sample weighed, volumes, and processing steps have been followed. The ML is used as the compliance evaluation level for DMR data. Effluent discharges at or below the ML would be considered in compliance with the effluent limit. MLs are promulgated in 40 CFR 136 which was subject to public notice and comment. Consequently, these MLs are the appropriate minimum quantification levels to use for NPDES monitoring data requirements because they represent the most stringent, scientifically reliable minimum quantification level available. The WQBELs for lead and silver (average

monthly limits for the ≥ 30 cfs flow tier) fell below the capability of current analytical technology to detect and/or quantify, therefore the final permit includes MLs for these parameters (see footnote 4 of Table 1).

The PQL is typically defined as a concentration 5 to 10 times the MDL. One criticism of the PQL procedure is the ambiguous nature of the multiplier. In addition, there is no provision for the use of the PQL in the NPDES regulations. As discussed above, MLs are promulgated in 40 CFR 136 and therefore are the appropriate minimum quantification levels to use. Therefore, EPA does not use the PQL to determine compliance with the effluent limits and the PQL will not be incorporated into the permit.

**Hecla Comment 38: Method Detection Limits - Use of 0.1 Times the Effluent Limit**

Hecla commented that methods need not be accurate to 0.1 of the effluent limit, they need only to be low enough to demonstrate compliance.

**Response:**

EPA agrees with this comment. Therefore, the first sentence in Part I.A.4. of the draft permit (which is Part I.A.7. of the final permit) was revised to read: "Method Detection Limits. For all effluent monitoring, the permittee shall use methods that can achieve a method detection limit (MDL) less than the effluent limitation of the minimum levels as specified in footnote 4 of Table 1. For parameters that do not have effluent limits, the permittee must use methods that can achieve MDLs less than or equal to those specified in Table 3 (Part I.C.)."

**Hecla Comment 39: Specific permit language - Section I.**

Hecla commented that there should not be additional constraints for pollutants that are monitored for and meet permit limits, therefore the second sentence of the first paragraph of Section I. should be modified as follows: "This permit does not authorize the discharge of any waste streams, including spills and other unintentional or non-routine discharges of pollutants, that are not part of the normal operation of the facility as disclosed in the permit application, **that exceed the permit limitations for the pollutants identified in the permit** or any other pollutants that are not ordinarily present in such waste streams."

**Response:**

The purpose of the second sentence of Section I. is to make it clear that the permittee cannot discharge pollutants or waste streams that were not disclosed in their permit application. This applies regardless of whether or not the discharge exceeds the effluent limits. A chemical spill, for example, might contain constituents for which effluent limits are not set in the permit. This interpretation is consistent with EPA's permit as a "shield" policy which is discussed in *Policy Statement on Scope of Discharge Authorization and*

*Shield Associated with NPDES Permits* issued by the Assistant Administrator for Water, Assistant Administrator for Enforcement, and General Counsel on July 1, 1994. In the final permit, the sentence was revised to read more clearly: "This permit authorizes the discharge of only those pollutants resulting from facility processes, waste streams, and operations that have been clearly identified in the permit application process".

**Hecla Comment 40: Boiler Plate Provisions**

The Fact Sheet (section VIII.C.) stated that "...sections III, IV, and V of the draft permit contain boilerplate requirements. Boilerplate is standard regulatory language that applies to all permittees and mut be included in NPDES permits. Because the boilerplate requirements are based on regulations, they cannot be challenged in the context of an NPDES permit action." Hecla commented that some of the language in these sections is not boilerplate. Hecla commented that they oppose any change of wording to the regulatory conditions in the regulations at 40 CFR 122.41 and 122.42(a) and that the permit reflect language verbatim from the regulations.

**Response:**

The Fact Sheet incorrectly implied that all the language in Sections III, IV, and V of the draft permit were boilerplate requirements. Rather, <u>the majority</u> of the language in these sections is boilerplate and verbatim from the NPDES regulations. Some changes to the regulatory language were made for the reasons discussed in the following responses. In addition, some language that is not verbatim from the NPDES regulations was included in the permit. The NPDES regulations at 40 CFR 122.43 allows for the establishment of additional permit conditions, as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of the CWA and regulations. The responses below address Hecla's comments on specific sections of the permit that are not verbatim.

**Hecla Comment 41: Specific permit language - Part III.A.**

Hecla commented that permit language in this section is not verbatim according to the regulations, appears to impose more stringent requirements, and are addressed adequately in the regulations at 40 CFR 122.41(j)(1) and 40 CFR 122.42(a)(1)&(2).

**Response:**

<u>first paragraph of Part III.A.:</u> The first sentence ("The permittee shall collect all effluent samples from the effluent stream prior to discharge into the receiving waters.") is not directly from the regulations. However, it is important in clarifying where effluent samples should be collected. Since it is applicable to effluent monitoring, this sentence was moved into Part I.A. of the final permit (see Part I.A.6.). The second sentence comes from 40 CFR 122.41(j)(1) and in the final permit was revised to read: "Samples and measurements taken for the purpose of monitoring shall be representative of the

monitored activity." which is the same as the regulatory language.

second and third paragraphs of III.A.: This language is not specifically contained in the NPDES regulations cited in the comment. It was added to ensure that any spills, bypasses, treatment plant upsets, or other non-routine events will not result in violation of the effluent limits. The third paragraph describes how such samples will be collected, analyzed, and reported. This provision is included in the EPA Region 10 NPDES permit template for all industrial facilities and was retained in the final permit. This language is necessary to ensure compliance with the CWA and the limits of the permit and is therefore authorized by 40 CFR 122.43(a) and 122.44.

**Hecla Comment 42: Specific Permit Language - Part III.B.**

Hecla commented that due to the remote location of the facility and the lag time inherent in the laboratory analysis procedures, the DMR due date should be by the 25th of the following month (rather than the 10th).

**Response:**

The draft permit language (at III.B.) requires DMRs to be submitted by the 10th day of the following month. This is the deadline that is in the current permit. For facilities in Region 10, DMR due dates range from the 10th day of the month to the 20th for facilities that have similar concerns (remote location). EPA has determined that the current reporting date can be changed to the 20th of the month to address the need for adequate time to report results. EPA has determined that this date (the 20th day of the following month) is reasonable; with adequate planning, results can be obtained in time to record them on the monthly DMR. A deadline beyond that date would be inconsistent with reporting requirements for other industrial facilities.

**Hecla Comment 43: Specific Permit Language - Part III.D.**

Hecla commented that the following provision should be removed from the permit since it is more stringent than the regulatory language at 40 CFR 122.41(1)(4)(ii): "The Permittee shall indicate on the DMR whenever it has performed additional monitoring, and shall explain why it performed such monitoring."

**Response:**

Since the regulatory language already requires the permittee to submit any additional monitoring, the sentence quoted in the comment was deleted in the final permit. If EPA requires an explanation as to why additional monitoring was performed, EPA will request that information.

**Hecla Comment 44: Specific Permit Language - Part III.E.**

Hecla commented that the following provision should be removed from the permit since it is more stringent than the regulatory language at 40 CFR 122.41(j)(3): "All effluent monitoring records shall bear the handwritten signature of the person who prepared them."

**Response:**

Since Part V.E. of the permit contains signatory requirements, the sentence quoted in the comment was deleted from the permit.

**Hecla Comment 45: Specific Permit Language - Part III.F.**

Hecla commented that the draft permit requirement that records be retained for at least five years be replaced with the requirement at 40 CFR 122.41(j)(2) that requires records to be retained for three years. Hecla also commented that this section requires additional records to be retained which is more stringent than that required by the regulations.

**Response:**

EPA requires that records be retained for five years since this is the expiration date of the permit and EPA may require these records for use in reissuing the permit. The clause "...or for the term of this permit, whichever is longer." was deleted so that Hecla will not be required to retain the data longer than five years if the permit is administratively extended.

It is unclear what additional records the last sentence of the comment refers to. The permit specifies that copies of DMRs and the NPDES permit be retained. While the regulatory language does not specify DMRs and the permit as such, it does state that "copies of all reports" be retained. The comment may refer to the term "but not limited to" in the first sentence of III.F. This term implies additional records beyond the scope of the regulatory language and was deleted from the final permit.

**Hecla Comment 46: Specific Permit Language - Part III.G.1.a., b., c. & d.**

Hecla commented that these sections of the permit are not consistent with the language at 40 CFR 122.41(l)(6) and appropriate changes should be made to the permit. Specifically,
III.G.1.a.: The draft permit language pulls a key phrase out of 122.41(l)(6)(1) thus changing the meaning.
III.G.1.b. and c.: The draft permit language adds "...or contributes to..." to the regulatory language making these provisions more stringent.
III.G.1.d: The regulatory language at 122.41(l)(6)(ii)(C) "...to be reported within 24 hours." was not included in the draft permit language.

**Response:**

III.G.1.a.: This language is the same as the first sentence in 122.41(l)(6). In the EPA Region 10 permit template, it is included in the list of items (rather than at the heading of the list as it appears in the NPDES regulations) requiring 24 hour reporting to clarify that the permittee shall report any noncompliance that may endanger health or the environment in the same manner as the permittee would report unanticipated bypass, upsets, and violations of the maximum daily discharge limitation. Moving it does not change the meaning, therefore the language will be retained.

III.G.1.b. and c.: EPA agrees. In the final permit, the term "that results in or contributes to an exceedence" was replaced by "which exceeds" to be consistent with 122.41(l)(6)(ii).

III.G.1.d.: The regulatory language at 122.41(l)(6)(ii)(C) states "Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See § 122.44(g))." Section 122.44(g) requires that the permit list pollutants which require 24 hour reporting of maximum daily discharge limit violations and that the list shall include any toxic pollutant or hazardous substance, or any pollutant specifically identified as the method to control a toxic pollutant or hazardous substance. The draft permit did not list which pollutants require 24 hour reporting. The final permit includes a footnote to the table of effluent limits (footnote 2 to Table 1 and footnote 1 to Table 2) that identifies the pollutants that require 24 hour reporting (the metals, cyanide, and WET) and III.G.1.d. has been revised to read: "any violation of a maximum daily discharge limitation for any of the pollutants listed in Table 1 and Table 2 of Section I.A. of the permit requiring 24-hour reporting." These changes are consistent with the intent of 122.41(l)(6)(ii)(C).

**Hecla Comment 47: Specific Permit Language - Paragraph III.G.2.e.**

Hecla commented that the language in this section is not required by the regulations at 40 CFR 122.41(l)(6)(i) and the requirement to provide "monitoring data" in a written report required within 5 days of an applicable occurrence ignores the reality of sample transportation/laboratory analysis and results validation that can take weeks to obtain.

**Response:**

Part III.G.2.e. has been removed from the permit since the requirement to submit this monitoring data is already required under Parts III.A. and III.D. of the final permit.

**Hecla Comment 48: Specific Permit Language - Paragraph III.G.3.**

Hecla commented that the phrase "at his sole discretion" which is not included in the regulations at 122.41(l)(6)(iii) has been added for no apparent reason. Hecla also commented that this section specifies one exact location for receiving the "oral report" and the regulatory language does not mandate one location/telephone number. Hecla is concerned that a situation where this particular telephone number is either temporarily out

of service or cannot be reached from their remote location would be a technical permit violation. Alternative contacts given to EPA Idaho Operations Office (IOO) or DEQ should also be allowed to meet this regulatory requirement.

**Response:**

The term "at his sole discretion" has been removed from the permit, since EPA agrees that it does not add any meaning. EPA agrees that the regulatory language does not mandate one location/telephone number, but neither does it prohibit one location/telephone number. The EPA Region 10 NPDES Compliance Office is the appropriate office to report non-compliance, not IDEQ or EPA IOO. IDEQ is not responsible for issuing or enforcement of this permit and EPA's IOO does not have a 24 hour compliance hotline.

**Hecla Comment 49: Specific Permit Language - Part III.H.**

Hecla commented that this section requires submittal of information not required by the regulations and the addition of the language "...not required to be reported within 24 hours..." is also not in the regulations.

**Response:**

Part III.H. of the permit is based on 40 CFR 122.41(l)(7) which states "The permittee shall report all instances of noncompliance not reported under paragraphs (l)(4), (5), and (6) of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (l)(6) of this section". The draft permit language replaced "paragraphs (l)(4), (5), and (6) of this section" with "not required to be reported with 24 hours". This is saying the same thing as the regulatory language (i.e., instances of noncompliance "not required to be reported within 24 hours" are those instances specified in (l)(4),(5), and (6)), without requiring the permittee to review the regulations to determine what (l)(4), (5), and (6) means. Therefore, this language was retained in the final permit.

**Hecla Comment 50: Specific Permit Language - Part IV.B.**

Hecla commented that this section is not verbatim from the regulations at 40 CFR 122.41(a).

**Response:**

EPA has recently revised the permit template for Part IV.B. (Penalties for Violations of Permit Conditions). The new language parallels the regulatory language while allowing for the civil and administrative penalty amounts to inflate over time (thus the references to the Federal Civil Penalties Inflation Adjustment Act and the Debt Collection Improvement Act in IV.B.1. and IV.B.2.). See Part IV.B. of the final permit for the revised language.

**Hecla Comment 51: Specific Permit Language - Part IV.E.**

Hecla commented that this section does not include the phrase "...which are installed by a permittee..." contained in 40 CFR 122.41(e).

**Response:**

EPA agrees, the phrase cited in the comment was added to the final permit.

**Hecla Comment 52: Specific Permit Language - Part IV.F.**

Hecla commented that this section does not appear to be a boilerplate requirement of 40 CFR 122.41.

**Response:**

Part IV.F. of the draft permit is not directly contained in the NPDES regulations. It was added to ensure that disposal of sludges and other pollutants removed in the course of treatment or control of water and wastewaters will not enter navigable waters. Since this is more appropriately identified as a best management practice (BMP), it was moved to Part II.D.5. of the final permit.

**Hecla Comment 53: Specific Permit Language - Part V.I.**

Hecla commented that this section adds language ("...nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.") that is not included in the regulatory requirements at 40 CFR 122.41(g).

**Response:**

The draft permit language in V.I. is from both 40 CFR 122.41(g) and 40 CFR 122.5(c). 40 CFR 122.5(c) states: "The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations." This is similar to the language quoted in the comment. The terms, "private", "personal", and "federal" will be removed from the permit language to make the final permit consistent with 122.41(g) and 122.5(c).

**Hecla Comment 54: Specific Permit Language - Part V.J.**

Hecla commented that there is no requirement in 40 CFR Part 122 for the "Severability" language of this section and this condition should be removed from the permit.

**Response:**

EPA reviewed the "Severability" language and agreed that it may be removed from the permit.

**Hecla Comment 55: Specific Permit Language - Part V.L.**

Hecla commented that there is no requirement in 40 CFR Part 122 for the "State Laws" section. If an issue of applicable state law arises, it is strictly a matter of state law and should not be in a federal permit, therefore this condition should be removed from the permit.

**Response:**

The "State Laws" language is not included in the regulations. However, it is an accurate statement of law and is included in EPA Region 10 permits to clarify that the NPDES permit does not relieve the permittee of liability under state law (such as state water quality standards).

**Hecla Comment 56: General Comment on Definitions**

Hecla commented that the Definitions section of the permit contains definitions that are not part of either codified federal or state regulations and the section must only include those specific definitions codified in federal regulations. Hecla's comments on specific definitions follows (comments 55 through 59).

**Response:**

There is no requirement in the NPDES regulations that definitions included in the permit must be limited to those codified in federal regulations. Definitions were included in the permit in order to clarify the meaning of terms according to the regulations or specific to the permit. Responses to Hecla's comments on specific definitions follows.

**Hecla Comment 57: Definitions - Terms Defined in the Great Lakes Initiative.**

Hecla commented that the definitions of "chronic toxic unit", "chronic toxicity", "method detection level", and "NOEC" are defined in the Great Lakes Initiative (GLI) only and the permit definitions do not reflect the codified definitions.

**Response:**

The definitions in the draft permit were not based upon the GLI (40 CFR 132.2) since the GLI does not apply to the Grouse Creek Mine. However, the definitions used as a source for the definitions in the draft permit were similar (wording slightly different, but meaning the same) to the GLI definitions. Following is a response to comments on the specific definitions:

<u>chronic toxic unit:</u> "Chronic toxic unit" is not defined in the GLI (40 CFR 132.2). The draft permit definition for this term was from the TSD. However, since this term is already defined in the text of the permit (Part I.B.3.d.), it was removed from the definitions section of the final permit.

chronic toxicity: The definition for this term has been removed from the final permit, since the only reference to chronic toxicity in the permit refers the permittee to *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms*, Third Edition (EPA-600-4-91-002) (EPA 1994b), which itself defines how to estimate chronic toxicity.

Method Detection Level: The draft permit provided a definition of "method detection level" that was based on the definition of "method detection limit" in 40 CFR 136, Appendix B (though it was not exactly word-for-word, it had the same meaning). Since 40 CFR 136 is applicable to the NPDES permits program, this definition is applicable to the permit. Since the permit specifies method detection limits (not levels), the final permit definition is for method detection limit. The wording of the definition has been slightly revised to be verbatim from the 40 CFR 136 definition.

NOEC: The definition of NOEC in the draft permit was based on the definition found in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Third Edition* (EPA-600-4-91-002) (EPA 1994b) which is referenced in 40 CFR 136.3, Table IA. The references in 40 CFR 136.3 apply to the NPDES permits program, therefore the definition in the referenced document is applicable. In the draft permit, the definition was not word-for-word as the chronic methods manual definition, though the meaning was the same. In the final permit, the definition of "NOEC" has been revised to be verbatim with the definition in the chronic methods manual.

**Hecla Comment 58: Definitions - Not Defined in Federal Regulations**

Hecla commented that the terms "final effluent" and "waste stream" are not defined in federal regulations.

**Response:**

final effluent: This term is not used in the permit. Therefore, it was deleted from the definitions in the final permit.

waste stream: This term is only used in the permit as a "shield" language of Part I.A. EPA determined that the specialized definition of "waste stream" in the definitions section of the permit is not necessary, therefore the definition has been deleted and the common sense definition applies.

**Hecla Comment 59: Definitions - not consistent with 40 CFR 122.2**

Hecla commented that the following definitions are not consistent with the federal regulatory definitions:

- "average monthly discharge limitation": The words "highest allowable" were deleted

from the codified definition of 40 CFR 122.2.
- "Director" and "Regional Administrator": These terms are not consistent with the definitions in 40 CFR 122.2.
- "Grab" and "24-hour composite": These terms are not consistent with the descriptions in 40 CFR 403, Appendix E.

**Response:**

average monthly discharge limitation: EPA agrees that "highest allowable" should be included in the definition. The definition has been revised accordingly.

Director: The 40 CFR 122.2 definition is "Director means the Regional Administrator or the State Director, as the context requires, or an authorized representative. When there is no "approved State program" and there is an EPA administered program, "Director" means the Regional Administrator." The Regional Administrator has authorized the Director of the Office of Water as an authorized representative. Therefore, the definition in the draft permit is consistent with the regulatory definition and was not changed in the final permit.

Regional Administrator: The 40 CFR 122.2 definition is "Regional Administrator means the Regional Administrator of the appropriate Regional office of the Environmental Protection Agency or the authorized representative of the Regional Administrator." The permit definition specifies EPA Region 10 as the appropriate Regional Office, otherwise the definition is the same. The definition in the draft permit is consistent with the regulatory definition and, therefore, was not changed in the final permit.

grab: The definition of "grab" in the draft permit was based on the definition from "Application Form 2C - Wastewater Discharge Information Consolidated Permits Program", EPA Form 3510-2C, (the permit form, EPA 1985). This happens to be the same as the definition in 40 CFR 403 (the pretreatment regulations), although the pretreatment regulations do not apply to this permit. The definition in the draft permit was not word-for-word from the definition on the permit form. The definition in the final permit has been revised to be verbatim from the permit form.

24-hour composite: The definition of "24-hour composite" in the draft permit was based on the definition in the permit form (EPA 1985). It was not verbatim from the definition in the permit form, although the meaning was the same. The definition in the final permit has been revised to be verbatim. An additional clause was added as the last sentence of the draft permit definition to specify how sample aliquots must be collected and stored. This is important to protect the quality of the sample and therefore will be retained in the final permit.

**Hecla Comment 60: Specific Permit Language - Page 1.**

Hecla suggested changing "authorization to discharge wastewater" to "authorization to discharge effluent" since the bulk of the water to be discharged through Outfall 002 will be storm water with a small amount of tailings pond underdrain water.

**Response:**

The term "wastewater" will be deleted so that the sentence just reads "authorization to discharge". This change is regardless of the source of the wastewater or effluent (e.g., effluent may include storm water that is mixed with mine drainage and tailings pond underdrain water as per Outfall 002).

**Hecla Comment 61: Compliance Schedule**

Hecla commented that a three-year compliance schedule should be allowed to allow time for construction of new water treatment facilities, if necessary, to meet the low effluent limits.

**Response:**

Idaho water quality standards at IDAPA 16.01.02.400.03 allow for compliance schedules where necessary to achieve compliance with water quality standards. As discussed in Section II.B., the State certified a three year compliance schedule for the copper ($\geq$ 30 cfs flow tier), mercury, zinc ($\geq$ 30 cfs flow tier) , and WET effluent limits and a compliance schedule until October 1, 2002 for the dilution ratio effluent limit. The final permit at Part I.A.5. incorporates the compliance schedule.

**Hecla Comment 62: Discharges to the Yankee Fork**

The draft permit assumes that the tailings impoundment will be dewatered under CERCLA. Hecla commented that the decision to use CERCLA authority is still pending approval and unless and until Hecla notifies EPA and IDEQ that it is withdrawing Outfall 003 from the permit application, provisions for discharging tailings impoundment water from Outfall 003 to the Yankee Fork must be included in the permit as requested.

**Response:**

At the time that the draft permit was written, an administrative order on consent (AOC) was being negotiated between EPA, the U.S. Forest Service (USFS), and Hecla that would provide for dewatering the tailings impoundment under CERCLA. Since that time the AOC has been finalized (effective date October 24, 2000) requiring dewatering of the impoundment. Therefore, there is no need to authorize Outfall 003 in the final permit.

**Hecla Comment 63: Fact Sheet**

Hecla provided a number of comments on the specific language in the fact sheet. These comments and responses are summarized in comments 64 to 80, below.

**Response:**

The Fact Sheet is a final document that provides a basis for the draft permit. The Fact Sheet, therefore, will not be changed. This response to comments document provides a record of the basis for changes to the draft permit to finalize the permit. EPA has, however, provided a response to Hecla's specific comments on the Fact Sheet as follows.

**Hecla Comment 64: Fact Sheet - pages 7 and 9**

Hecla commented that the references to mine drainage need clarification since the regulatory definition of mine drainage is specific to "active" mine facilities and the Grouse Creek Mine is no longer active. Waters generated by precipitation are considered storm water runoff and should be regulated as such. Hecla commented that the only waters that are not storm water are waters contained in the tailings pond and other waters that tailings pond water commingles with, such as pond seepage contained in the underdrain water.

**Response:**

EPA agrees that the 40 CFR 440 guidelines define mines as "active" facilities. This is discussed in Appendix B, Section II. of the Fact Sheet, which also discussed EPA's best BPJ determination that the characteristics of mine drainage from the inactive Sunbeam mine adit is similar to that of an active mine. In addition, information submitted by Hecla in support of their permit application indicate that discharge from the mine occurs year around (i.e., not only in response to storm events) and that the pH of the discharge averages 3.4. These are not characteristics of storm water.

**Hecla Comment 65: Fact Sheet - page 7, paragraph 4**

Hecla commented that seepage from the waste rock storage facility should be clarified as storm water that has infiltrated through the cap and subsequently daylight.

**Response:**

This clarification is not needed, since the seepage from the waste rock storage area combines with other wastewater and therefore is not considered storm water (40 CFR 122.26(b)(14)).

**Hecla Comment 66: Fact Sheet - page 8**

Hecla commented that the term processing has a specific meaning within EPA regulations that does not include the mining and milling activities at the GCU. The proper term is "beneficiation".

**Response:**

The term "processed" was used on page 8. EPA did not intend to categorize the activities at the GCU as either "processing" or "beneficiation". Such categorization is not important in the context of the NPDES Fact Sheet.

**Hecla Comment 67: Fact Sheet - page 8**

Hecla commented that discharges from the tailings pond are allowed under the current permit under certain "excess" precipitation events.

**Response:**

EPA agrees that the current permit allows discharge from the tailings impoundment only if certain conditions are met.

**Hecla Comment 68: Fact Sheet - page 8**

Hecla commented that the tailings impoundment does not cover 197 acres. The actual total acreage is about 105 acres.

**Response:**

Comment noted.

**Hecla Comment 69: Fact Sheet - page 8**

Hecla commented that the statement that "the source of cyanide was leakage from the tailings impoundment." is incorrect as discussed in the Site Characterization Report dated January 31, 2000.

**Response:**

Based on conversations with the EPA (Greg Weigel) and USFS (Dean Morgan) CERCLA personnel, the source of cyanide included leakage from the impoundment as well as historical spills.

**Hecla Comment 70: Fact Sheet - pages 8 and 9**

Hecla commented that the statements regarding the CERCLA Consent Order are incorrect: (page 8 - "EPA, state of Idaho, USFS and Hecla have entered into a Consent Order..." and page 9 - "Because the tailings impoundment will be dewatered under the CERCLA Consent Order..."). The parties have not, and perhaps will not ever enter into such a Consent Order, therefore discharges from Outfall 001 and Outfall 003 must be included in the permit.

**Response:**

The statements in the comment were incorrectly quoted. The third paragraph of page 8 states that "EPA, the State of Idaho, the U.S. Forest Service, and Hecla **are negotiating** a Consent Order..." (bold added), not that they have already entered into one. This was correct at the time that the draft permit was issued for public notice. The first paragraph on page 9 states that the "...underdrain water **will generally be discharged pursuant to the CERCLA action**." (bold added). This was assumed at the time that the draft permit was issued. However, the Fact Sheet goes on to state that discharge (of the underdrains) will be allowed through Outfall 002. As discussed in response to comment 62, the USFS, EPA, and Hecla have since entered into an AOC which requires dewatering the tailings impoundment. Therefore, outfalls 001 and 003 are not included in the final permit.

**Hecla Comment 71: Fact Sheet - page 9**

Hecla commented that the date of September 17, 1992 for the application renewal is incorrect. The application for permit renewal was submitted on May 2, 1997.

**Response:**

EPA agrees that the date in the Fact Sheet is incorrect. The correct date of May 2, 1997 was included in the references (Appendix E of the Fact Sheet).

**Hecla Comment 72: Fact Sheet - page 10**

Hecla commented that the first sentence of the last paragraph should be changed to read "EPA followed **selected portions of** the Clean Water Act (CWA), state, and federal regulations, and EPA 1991 *Technical Support Document for Water Quality-Based Toxics Control* (TSD) to develop the effluent limits in the draft permit."

**Response:**

The sentence does not need to be revised. EPA did follow the CWA, state and federal regulations, and the TSD to develop the effluent limits in the draft permit.

**Hecla Comment 73: Fact Sheet - page 11**

Hecla provided the following comments on page 11:

- second paragraph: Hecla is not aware of water quality-based limitations for WET.
- second bullet: Resident species are not used in the WET tests, therefore the testing results do not say anything about toxic substances in concentrations that impair designated uses. It is not readily apparent how the State regulations would require WET testing. The State regulation quoted was never intended to infer a requirement for WET limits.
- third bullet: The increase in effluent flow was due to precipitation in the drainage.
- fourth bullet: Loadings do not need to be controlled as effluent flow will be dictated by precipitation in the drainage.

**Response:**

second paragraph: The water quality-based limitations for WET are found in Table 1 of the Fact Sheet and Table 1 of the permit.

second bullet: See response to Hecla comments 12, 13, and 16.

third bullet: Comment noted.

fourth bullet: Effluent flow may vary with precipitation, however, that does not preclude the need to control the total loading to the receiving water. See also response to Hecla comments 1 and 7.

**Hecla Comment 74: Fact Sheet - page 12, Table 1**

Hecla commented that the phrase "or available cyanide by method OIA-1677 in EPA's rulemaking dated December 30, 1999" be added to notation 1.

**Response:**

See response to Hecla comment 26.

**Hecla Comment 75: Fact Sheet - page 13, last paragraph**

Hecla commented that EPA should clarify why Region 10 guidance is used for method detection limits and not EPA Headquarters guidance.

**Response:**

EPA Region 10 guidance was used since the EPA Headquarters guidance is draft and has not been issued final.

**Hecla Comment 76: Fact Sheet - page 14**

- first paragraph: Hecla commented that the first sentence of the first paragraph should be removed since there is no basis for stating that WET testing will replicate any effect or actual environmental exposure to biota in Jordan Creek.
- second paragraph: Hecla commented that the referenced Idaho water quality standard for the implementation of WET testing is a narrative that is applicable for water bodies where numeric water quality criteria are not available and this would not apply to Jordan Creek.

**Response:**

first paragraph: The first sentence states that WET test replicate "to the greatest extent possible" the total effect and actual environmental exposure of aquatic life to effluent toxicants. This sentence is correct.

second paragraph: The Idaho water quality standards states that "the general water quality criteria apply to all surface waters of the state, in addition to the water quality criteria set forth for specifically designated waters" (IDAPA 58.01.02200.). The narrative criterion for toxic substances is one of these general water quality criteria and therefore the narrative criterion applies in addition to the numerical criteria.

**Hecla Comment 77: Fact Sheet - page 18**

Hecla commented that the State water quality standards on mixing zones are not standards at all but are guidance to be considered in the determination of mixing zones. The determination of the appropriate mixing zones is under the authority of the Sate of Idaho, and not the EPA, NMFS, or USFWS.

**Response:**

The Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02060) include a section entitled "Mixing Zone Policy". EPA agrees that the State has the authority to establish mixing zones. However, in the absence of a preliminary 401 certification from IDEQ, EPA followed the IDEQ's policy and considered the input of NMFS and the USFWS in informal consultation, in establishing the mixing zones upon which the draft permit effluent limits are based. The effluent limits in the final permit are based upon the mixing zones in IDEQ's CWA Section 401 Certification (see Section II.B., above). See also response to Hecla comments 2 and 3.

**Hecla Comment 78: Fact Sheet - page B-1**

Hecla commented that BADT and NSPS apply to active facilities and the Grouse Creek Unit is inactive.

**Response:**

EPA's regulations require NPDES permits to contain effluent limitations necessary to meet applicable technology-based requirements of Federal and State law (40 CFR 122.44(a)). These technology-based requirements are derived directly from application of national effluent limitation guidelines (e.g., BADT, NSPS). EPA agrees that BADT and NSPS as cited in the Fact Sheet apply to active facilities and that the Grouse Creek Unit is inactive. However, in the absence of applicable effluent limitation guidelines, the NPDES regulations at 40 CFR 122.44 and 125.3 require the determination of technology-based effluent limits on the basis of the permitting authority's best professional judgement (BPJ). As discussed in the Fact Sheet, EPA determined, based on BPJ, that the NSPS effluent limitations are the technology-based effluent limits applicable to Outfall 002. See also response to Hecla comments 8 and 64.

**Hecla Comment 79: Fact Sheet - Table B-2**

Hecla commented that the WET criteria and permit conditions should be removed since there are no State of Idaho WET testing water quality criteria that apply to Jordan Creek or Outfall 002 and the use of Toxic Units as water quality criteria have no basis in Idaho law.

**Response:**

See response to Hecla comments 12 and 13.

**Hecla Comment 80: Fact Sheet - page B-9, last paragraph**

Hecla commented that the determination of mixing zones is a State of Idaho determination, including mixing zones for metals that might bioaccumulate and this paragraph should be modified to reflect this.

**Response:**

See response to Hecla comments 2, 3, 6, and 77 and Section II.B.

## C. E.D. Moon Comment

The following comment was received from Mr. E.D. Moon in regards to the draft permit.

**Moon Comment 1:**

Mr. Moon expressed concern with the levels of cyanide in Jordan Creek. He provided extensive monitoring data and calculations to show how the cyanide in the creek might be leaching the gold and silver contained in his and other placer miners claims. He commented that the NPDES permit should be denied based on Hecla's poor record of sampling Jordan Creek for cyanide and other contaminants. He also commented that the number of spills taking place at the mine indicates that Hecla does not have the expertise to handle a competent sampling program or a settling pond reclamation. He suggested that the sampling and reclamation of the settling pond should be controlled by some competent independent company that reports directly to the EPA or the Idaho DEQ.

**Response:**

The draft and final permits are consistent with all aspects of the Clean Water Act (CWA). The permit establishes effluent limits for cyanide based upon the water quality criteria for protection of aquatic life and human health in Jordan Creek. EPA does not have the authority to establish limits or deny an NPDES permit based upon other uses (such as economic impacts to other mines).

Sampling associated with the NPDES permit will be conducted by Hecla. That is because

in the NPDES program, the permittee is responsible for attaining, monitoring, and maintaining compliance with the requirements in their permit. Therefore, most of the routine information about the effluent is gathered by the permittee. The permit has incorporated specific requirements (e.g., Quality Assurance Plan (QAP), specified analytical requirements, detailed monitoring and reporting requirements, etc.) to ensure that the information provided by the permittee is accurate and representative of the discharge or receiving waters. Additionally, EPA verifies compliance with permit conditions by reviewing and tracking submitted reports (e.g., discharge monitoring reports (DMR)) and inspecting the facility. It is important to note that failure to comply with any requirements stated in the permit is a violation of the CWA.

The remediation and reclamation of the tailings pond is not associated with the NPDES permit. Currently Hecla is under a consent order with EPA and the USFS to conduct this work. Remediation of the tailings pond and sampling associated with it will be conducted by Hecla with oversight from EPA and the USFS. Oversight involves review and approval of work plans, monitoring plans, and sample reports and regular inspections.

## D. United States Department of Agriculture, Forest Service (USFS) Comments

The following comments were received from the USFS in regards to the draft permit.

**USFS Comment 1:**

The USFS expressed concern that an algae bloom in Jordan Creek immediately downstream of the Outfall 002 discharge could lead to degradation of critical habitat for the listed salmonid species. They also expressed concern that temperature fluctuations below Outfall 002 may be a component in the formation of the algae bloom and potentially impact the listed salmonids. They note a trend of elevated levels of nitrate between surface water quality monitoring stations S-3 (upstream of Outfall 002) and S-4 (downstream of Outfall 002) that might be a second component in the formation of the algae bloom. The USFS specifically recommended that the following monitoring be conducted at surface water monitoring stations above and below the outfall:

(a.) Continuous temperature monitoring within the salmonid spawning time frame of June 1 to October 1.

(b.) Continuous data logger to evaluate levels of nitrate or other constituents that may contribute to the formation of algae.

(c.) Correlate stream flow measurements to evaluate the effects of constituent loading, temperature variations, and algae formation within the salmonid spawning time frame listed above.

**Response:**

response to (a.): The draft permit required quarterly monitoring for temperature. EPA agrees that more frequent monitoring is needed during salmonid spawning. However, daily monitoring, rather than continuous temperature monitoring should be sufficient. A requirement was added to the final permit (Part I.C.3.) for daily temperature monitoring at locations S-3 and S-4 from June 1 to October 1.

response to (b.): The draft permit required that the effluent be monitored monthly and the receiving waters be monitored quarterly for ammonia. Nitrate was not considered during development of the draft permit. EPA agrees that nitrate monitoring should be included in the final permit (see also response to BWCC/ICL comment 1), however monitoring at the same frequency as the other chemical parameters in the permit (rather than continuously) is appropriate. The final permit, therefore, requires monthly monitoring of the effluent and quarterly monitoring of the receiving water for nitrate and nitrite (see Part I.A. (Table 1) and Part I.C. (Table 3) of the final permit).

response to (c.): The comment was not specific on how the correlation of stream flow, constituent loading, and temperature variations on algae formation should occur. The comment implies that there be some measure of algae formation, but did not specify how this would be measured. WET monitoring, surface water monitoring, and bioassessment monitoring will be used to gauge the impacts of the discharge. The NPDES permit establishes effluent limits based on water quality standards. The ammonia and nitrate-nitrite monitoring of the effluent and receiving waters will be sufficient to determine the need for effluent limits for these parameters in the future (without the correlation study suggested). This comment was therefore, not incorporated into the final permit.

## APPENDIX A - REFERENCES


EPA 1985. Application Form 2C - Wastewater Discharge Information Consolidated Permits Program. EPA Form 3510-2C, Revised February 1985).

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, USEPA, Office of Water. Washington, D.C. March 1991

EPA 1992. Status of Certain New Analytical Methods Intended for Use Under 40 CFR Part 136. Memorandum from Thomas A. Clark, Director, Environmental Monitoring Systems Laboratory - Cincinnati to Dana Rasmussen, Regional Administrator, USEPA Region X. November 3, 1992.

EPA 1993a. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and marine Organisms*, Fourth Edition, EPA/600-4-90-027F, August 1993.

EPA 1993b. *Guidance Manual for Developing Best Management Practices*, EPA 833-B-93-004, October 1993.

EPA 1994a. EPA Whole Effluent Toxicity (WET) Control Policy, EPA 833-94-002, July 1994.

EPA 1994b. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms Third Edition*, EPA-600-4-91-002, July 1994**.**

EPA Region 9 and 10 1996. *Regions 9 and 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs.* EPA Regions 9 and 10. May 31, 1996.

EPA Region 10 1996. *EPA Region 10 Guidance for WQBELs Below Analytical Detection/Quantitation Level.* NPDES permits Unit, EPA Region 10. Seattle, WA. March 1996.

EPA 1997. Clarifications Regarding Whole Effluent Tonicity Test Methods Recently Published at 40 CFR 136 and Guidance on Implementation of Whole Effluent Toxicity in Permits**"**, memorandum from T.T. Davies, Director, Office of Science and Technology to Water Management Division Directors, Regions I - X, July 21, 1997

Hecla 2001a. Letter from Paul Glader, Hecla, to Patty McGrath, EPA, NPDES Permit No. ID-002646-8, Request For Removal of the Dilution Ratio Permit Condition. Dated September 25, 2001.

Hecla 2001b. Letter from Paul Glader, Hecla, to Patty McGrath, EPA, NPDES Permit No. ID-002646-8, Comments Regarding Draft Final NPDES Permit for the Grouse Creek unit, Biological Evaluation Package Dated February 6, 2001. Dated September 28, 2001.

IDEQ 2000. Letter from James Johnston, IDEQ, to Robert Robichaud, EPA, Clarification of IDEQ CWA 401 Certification of NPDES Permit No. ID-002646-8, Hecla Mining Company, Grouse Creek Unit Outfall 002. Dated October 3, 2000.

IDEQ 2001. Letter from James Johnston, IDEQ, to Robert Robichaud, EPA, Amendment of IDEQ CWA 401 Certification of NPDES Permit No. ID-002646-8. Dated December 4, 2001.

# APPENDIX B

# IDEQ CLEAN WATER ACT SECTION 401 CERTIFICATION

**APPENDIX C**
**RECALCULATION OF WATER QUALITY-BASED EFFLUENT LIMITS FOR THE FINAL PERMIT**

Since preparation of the draft permit, the water quality-based effluent limits (WQBELs) were recalculated to take into account the following changes (the changes were a result of comments on the draft permit and the State of Idaho's final Clean Water Act Section 401 certification):

- use of a 8:1 dilution ratio
- updated effluent and receiving water chemistry data
- the State-certified mixing zones

The response to comments provides the basis for the above changes. This appendix describes how these changes impacted the calculation of the WQBELs from the draft to the final permit.

In determining whether WQBELs are needed and developing those limits when necessary, EPA follows guidance in the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991). The water quality-based analysis consists of four steps:

1. Determine the appropriate water quality criteria (see Section I., below).
2. Determine if there is "reasonable potential" for the discharge to exceed the criteria in the receiving water (see Section II., below).
3. If there is "reasonable potential", develop a wasteload allocation (WLA) (Section III.).
4. Develop effluent limitations based on the WLA (see Section III., below).

These steps are discussed in detail in Appendix B of the Fact Sheet (EPA 1999) that accompanied the draft permit. The following sections discuss each step in terms of how the final 401 certification and comments on the permit changed the information incorporated into the step and the outcome. Section IV. provides a summary of the effluent limits in the final permit. Section V. provides an example calculation to illustrate how these steps were implemented in calculating the WQBELs in the final permit.

## I. Water Quality Criteria

The first step in developing WQBELs is to determine the applicable water quality criteria. The applicable water quality criteria used in the draft permit calculations are discussed in detail in the Fact Sheet (Appendix B, Section III.A.) and are shown in Table C-1. Most of the water quality criteria are the same as those reported in the draft permit. The exception is the hardness-based criteria under low flow conditions (< 30 cfs in Jordan Creek). The aquatic life criteria for cadmium, chromium III, copper, lead, nickel, silver, and zinc are calculated as a function of hardness measured in mg/l of calcium carbonate ($CaCO_3$). The hardness is determined by calculating the 5th percentile of the hardness values measured at Jordan Creek monitoring location S-4 (downstream of Outfall 002). The hardness values in the draft permit were based on

data collected from 1994 (when discharge from Outfall 002 commenced) through 1998. The hardness values in the final permit are based on data collected from May 1997 (when operation of the treatment plant commenced) through May 2000. Data collected after May 1997 was used since it is more representative of the current and expected future conditions. This results in 5th percentile hardness values of 25 mg/l $CaCO_3$ for high flow ($\geq$ 30 cfs) and 49 mg/l $CaCO_3$ for low flow (< 30 cfs). These values were used to calculate the hardness-based water quality criteria in Table C-2 for the final permit calculations.

Table C-1: Water Quality Criteria Applicable to Outfall 002 (same as Table B-2 of the Fact Sheet)

| Parameter, µg/l unless otherwise noted | Cold Water Biota - Aquatic Life Criteria[1] | | Primary and Secondary Contact Recreation Criteria (consumption of organisms)[2] |
|---|---|---|---|
| | Acute Criteria | Chronic Criteria | |
| Arsenic | 360 | 190 | 50 |
| Cadmium | see Table C-2 | see Table C-2 | NA |
| Chromium III | see Table C-2 | see Table C-2 | NA |
| Chromium VI | 16 | 11 | NA |
| Copper | see Table C-2 | see Table C-2 | NA |
| Lead | see Table C-2 | see Table C-2 | NA |
| Mercury | 2.0 | 0.012 | 0.15 |
| Nickel | see Table C-2 | see Table C-2 | 4600 |
| Selenium | 20 | 5 | NA |
| Silver | see Table C-2 | NA | NA |
| Zinc | see Table C-2 | see Table C-2 | NA |
| Cyanide, WAD[3] | 22 | 5.2 | 220,000 |
| pH (s.u.) | within the range of 6.5 - 9.5 | | NA |
| WET (TU) | surface waters shall be free from toxic substances in concentrations that impair designated uses[4] | | |

Footnotes:

1 - The aquatic life criteria for toxics (metals and cyanide) are based on IDAPA 58.01.02210. This section cites the National Toxics Rule (NTR), 40 CFR 131.36(b)(1). The aquatic life criteria for arsenic, cadmium, chromium, copper, lead, mercury (acute only), nickel, silver, and zinc are expressed as the dissolved. The aquatic life criteria for cadmium, chromium III, copper, lead, nickel, silver, and zinc are calculated as a function of hardness and are shown in Table C-2. The aquatic life criteria for pH is based on IDAPA 16.01.02250.01.a.

2 - The recreation criteria are based on IDAPA 58.01.02210., which cites the NTR (except for arsenic which is specified as 50 ug/l in the Idaho standards).

3 - The cyanide criteria is expressed as weak acid dissociable (WAD), per IDAPA 58.01.02210.02.d.

4 - The WET criteria is based on IDAPA 58.01.02200.02. EPA's recommended magnitudes for this narrative criterion are 1 $TU_c$ and 0.3 $TU_a$ for the chronic and acute criteria, respectively (TSD 1991). TU means toxicity (see response to Hecla comment 13).

**Table C-2: Hardness-based Water Quality Criteria Applicable to Outfall 002**

| Parameter | Hardness-Based Aquatic Life Criteria (H = hardness) | | | Dissolved Criterion, ug/l (total criterion x conversion factor) | |
|---|---|---|---|---|---|
| | | | | for Jordan Creek flows < 30 cfs (H = 49 mg/l) | for Jordan Creek flows ≥ 30 cfs (H= 25 mg/l) |
| Cadmium | acute | conv. factor | 1.136672 - (0.041838)lnH | 1.7 | 0.82 |
| | | criterion (total) | exp [(1.128(lnH) - 3.828] | | |
| | chronic | conv. factor | 1.101672 - (0.041838)lnH | 0.61 | 0.37 |
| | | criterion (total) | exp [(0.7852)lnH - 3.490] | | |
| Chromium III | acute | conv. factor | 0.316 | 310 | 180 |
| | | criterion (total) | exp [(0.818)lnH + 3.688] | | |
| | chronic | conv. factor | 0.86 | 99 | 57 |
| | | criterion (total) | exp [(0.818)lnH + 1.561] | | |
| Copper | acute | conv. factor | 0.960 | 8.7 | 4.6 |
| | | criterion (total) | exp [(0.9422)lnH - 1.464] | | |
| | chronic | conv. factor | 0.960 | 6.2 | 3.5 |
| | | criterion (total) | exp [(0.8545)lnH -1.465] | | |
| Lead | acute | conv. factor | 1.46203 - (0.145712)lnH | 29 | 14 |
| | | criterion (total) | exp [(1.273)lnH - 1.460] | | |
| | chronic | conv. factor | 1.46203 - (0.145712)lnH | 1.1 | 0.54 |
| | | criterion (total) | exp [(1.273)lnH - 4.705] | | |
| Nickel | acute | conv. factor | 0.998 | 770 | 440 |
| | | criterion (total) | exp [0.846(lnH) + 3.3612] | | |
| | chronic | conv. factor | 0.997 | 86 | 49 |
| | | criterion (total) | exp [0.846(lnH) + 1.1645] | | |
| Silver | acute | conv. factor | 0.85 | 1.0 | 0.32 |
| | | criterion (total) | exp [1.72(lnH) - 6.52] | | |
| Zinc | acute | conv. factor | 0.978 | 63 | 35 |
| | | criterion (total) | exp [0.8473(lnH) + 0.8604] | | |
| | chronic | conv. factor | 0.986 | 57 | 32 |
| | | criterion (total) | exp [0.8473(lnH) + 0.7614] | | |

## II. Reasonable Potential Evaluation

As discussed in the Fact Sheet, the NPDES regulations require that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." To determine if there is "reasonable potential" to cause or contribute to an exceedence of water quality criteria for a given pollutant, for each pollutant present in a discharge, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is "reasonable potential", and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 TSD to conduct this "reasonable potential" analysis.

The "reasonable potential" analysis for the draft permit was presented in detail in Appendix B of the Fact Sheet. This section discusses how the comments on the draft permit and the final 401 certification changed some of the input parameters in the reasonable potential analysis.

The maximum projected receiving water concentration is determined using the following mass balance equation.

$$C_d = \frac{(C_e \times Q_e) + [C_u \times (Q_u \times MZ)]}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation 1)}$$

where,

$C_d$ = receiving water concentration downstream of the effluent discharge (concentration at the edge of the mixing zone)
$C_e$ = maximum projected effluent concentration
$C_u$ = receiving water upstream concentration of pollutant
$Q_e$ = effluent flow
$Q_u$ = receiving water upstream flow
MZ = the percent mixing zone based on receiving water flow

The water quality criteria for some of the metals of concern are expressed as dissolved. Yet effluent concentrations and NPDES permit limits are expressed as total recoverable metals. To account for the difference between total effluent concentrations and dissolved criteria, "translators" are used in the reasonable potential (and permit limit derivation) equations. Therefore, for those metals with criteria expressed as dissolved, Equation 1 becomes:

$$C_d = \frac{\text{translator} \times (C_e \times Q_e) + [C_u \times (Q_u \times MZ)]}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation 2)}$$

After $C_d$ is determined, it is compared to the applicable water quality criterion. If $C_d$ is greater than the criterion, a water quality-based effluent limit is developed for that parameter.

The following briefly describes each of the factors used in the equations 1 and 2 to calculate $C_d$. For a more detailed description see Appendix B, Section III.B. of the Fact Sheet.

translator: As discussed on page B-7 of the Fact Sheet, since site-specific translators are not available, the water quality criteria conversion factors (see Table C-2) were used as the translator in Equation 2.

$C_e$ (maximum projected effluent concentration): Per the TSD, the maximum projected effluent concentration in the mass balance equations is represented by the 99$^{th}$ percentile of the effluent data and calculated as follows:

$C_e$ = (maximum measured effluent concentration) x RPM (Equation 3)

The reasonable potential multiplier (RPM) accounts for uncertainty in the effluent data and is determined based on the coefficient of variation (CV) of the data and the number of data points. The maximum measured effluent concatenations and RPMs used to calculate $C_e$ in the draft permit were based on Outfall 002 data collected from May 1997 through June 1999. Additional effluent data collected since this time (through June 2000) have been included in the determination of $C_e$ for the final permit calculations. The additional data did not change the value of the maximum effluent concentration, however some of the CVs and most of the RPMs are different. These data are provided in Table C-3.

$C_u$ (upstream concentration of pollutant): The upstream concentration in the mass balance equations is based on a reasonable worst-case estimate of the pollutant concentration upstream from the discharge point. Monitoring data from location S-3 (upstream of Outfall 002) collected from 1994 through June 1999 were used to determine upstream concentrations for the draft permit calculations. Additional monitoring data from location S-3 collected through June 2000 has been factored into the determination of $C_u$. In addition, Hecla supplied additional monitoring data for copper and zinc through August 2001 (Hecla 2001) that has been factored into the determination of $C_u$. The $C_u$ values are provided in Table C-3. With the exception of copper, zinc, and WAD cyanide, the upstream concentrations used in the final permit are the same as for the draft permit.

$Q_u$ (upstream flow): As discussed in the Fact Sheet, Jordan Creek flow varies dramatically with precipitation and snow melt, with peak flows occurring in May and June. Therefore, effluent limits were developed representative of both low flow (< 30 cfs) and high flow conditions (≥ 30 cfs). The $Q_u$'s used for these conditions are the same values as used in the draft permit calculations.

$Q_u$ for the < 30 cfs Jordan Creek flow tier = 1.2 cfs
$Q_u$ for the ≥ 30 cfs Jordan Creek flow tier = 30 cfs

Table C-3: Summary of Data Used to Determine Reasonable Potential and Develop Effluent Limits

| Parameter | Effluent Data [1] | | | Receiving Water Upstream Concentration ($C_u$) [5] | |
|---|---|---|---|---|---|
| | Maximum Effluent Concentration [2] | Coefficient of Variation (CV) [3] | Reasonable Potential Multiplier (RPM) [4] | total | dissolved |
| Arsenic, ug/l | 55 | 0.6 | 1.3 | 2.5 | 1 |
| Cadmium, ug/l | 100 | 0.6 | 1 | na | 0 |
| Chromium, ug/l | 14 | 0.6 | 1.3 | na | 0 |
| Copper, ug/l | 300 | 1.0 | 1 | na | 2.4 |
| Lead, ug/l | 600 | 0.6 | 1 | na | 0 |
| Mercury, ug/l | 2 | 0.6 | 1 | 0 | 0 |
| Nickel, ug/l | 30 | 0.5 | 1.2 | 0 | 0 |
| Silver, ug/l | 7 | 0.6 | 1.3 | na | 0 |
| Zinc, ug/l | 1500 | 0.7 | 1 | na | 18 |
| WAD Cyanide, ug/l | 110 | 0.8 | 1.4 | 2.5 | na |
| Whole Effluent Toxicity (WET), $TU_c$ | 12.8 | 0.8 | 3.4 | 0 | 0 |

na = not applicable (receiving water concentrations are only needed for the form in which the criterion is expressed)

Footnotes:

1 - The effluent data is based on sampling of Outfall 002 conducted by Hecla and EPA from May of 1997 through June 2000. The metals data is expressed as the total form.

2 - For those parameters that have technology-based effluent limitations (cadmium, copper, lead, mercury, and zinc), the maximum effluent concentration used in equation 5 is the maximum daily technology-based effluent limit (see Table B-1 of the Fact Sheet). The technology-based effluent limit is used since water quality-based effluent limits are only required if discharge at the technology-based limits have reasonable potential to exceed water quality standards in the receiving water. For parameters that do not have technology-based effluent limitations (arsenic, chromium, nickel, silver, WAD cyanide, and WET), the maximum measured effluent concentration is the maximum value measured in Outfall 002 from May of 1997 through June 2000. The maximum WET concentration was calculated as follows: max. WET concentration in $TU_c$ = 100/lowest $IC_{25}$

3 - Where the majority of the effluent data was reported at less than detection limits, effluent-specific variability cannot be determined so a default CV of 0.6 was assumed. This was the case for all parameters except copper, nickel, zinc, WAD cyanide, and WET. For these parameters adequate data existed to calculate the CV (standard deviation of the data divided by the mean).

4 - For parameters with technology-based effluent limitation guidelines, the RPM is 1. For other parameters the RPM is based on the CV and the number of data points. For metals and cyanide, 180 data points were available . For WET, 13 data points were available.

5 - The upstream concentrations are based on samples collected from Jordan Creek monitoring location S-3 from 1994 through June 2000 (for copper and zinc, through August 2001). For dissolved cadmium, lead, mercury, and silver, the analytical detection limits were not adequate to quantify background (all but one sample was reported at less than detection limits), therefore zero was used as $C_u$. No data was available for chromium, nickel and WET, therefore zero was used. For arsenic, copper, and zinc, $C_u$ represents the 95$^{th}$ percentile of the data where ½ the detection limit was assumed for non-detected values. For WAD cyanide $C_u$ represents ½ the detection limit.

$Q_e$ (effluent flow): The effluent flows used in the draft permit calculations were based on the maximum effluent flow reported during each receiving water flow tier. Based on comments on the draft permit, the effluent flows for the final permit calculations are based on a dilution ratio of 8:1 (ratio of the upstream receiving water flow to the effluent flow). See response to Hecla comment 1. This minimum dilution ratio is applicable to both high and low receiving water flow tiers. The effluent flows to use in the mass balance equation are calculated from the dilution ratio based on the following equation:

$$Q_e = Q_u / \text{dilution ratio}$$

Therefore, $Q_e$ for the flow tiers are:

< 30 cfs Jordan Creek flow tier: $Q_e = 1.2 \text{ cfs}/8 = 0.15 \text{ cfs}$

≥30 cfs Jordan Creek flow tier: $Q_e = 30 \text{ cfs}/8 = 3.75 \text{ cfs}$

MZ (the percent mixing zone based on receiving water flow): The mixing zones used in the draft permit calculations assumed 25% of the stream volume for compliance with aquatic life chronic criteria (except for mercury and WAD cyanide). No mixing zones were allowed for compliance with aquatic life acute criteria or for mercury and WAD cyanide. As discussed in Section II.B., of the response to comments, IDEQ provided a final certification authorizing mixing zones for the final permit. These mixing zones are shown in Table C-4 and were used to determine the final effluent limits.

Table C-4: Mixing Zones for Outfall 002

| Parameter | Mixing Zone (% volume of the receiving water)[1] |
|---|---|
| Cadmium | 75% |
| Chromium | 100% |
| Copper | 50% |
| Lead | 100% |
| Mercury | 100% |
| Silver | 25% |
| Zinc | 50% |
| WAD Cyanide | 100% |
| WET | 100% |

footnote 1: The mixing zones apply to the aquatic life criteria. IDEQ authorized a 100% mixing zone for compliance with recreational criteria.

Reasonable Potential Summary: Using the above equations and data, reasonable potential was re-evaluated for the parameters measured in Outfall 002. A summary of the results of the reasonable potential analysis is provided in Table C-5. Except for chromium, the parameters that exhibited reasonable potential are the same as the parameters that exhibited reasonable potential in the draft permit. Due to the increased size of the mixing zone, chromium no longer exhibits reasonable potential. An example of the reasonable potential determination for cadmium is provided in Section V. to demonstrate the reasonable potential analysis.

Table C-5: Summary of Reasonable Potential (RP) Determination for Outfall 002

| Parameter | RP for Jordan Creek Flows < 30 cfs | | | | RP for Jordan Creek Flows ≥ 30 cfs | | | |
|---|---|---|---|---|---|---|---|---|
| | Maximum Projected Receiving Water Concentration ($C_d$)[2] | | | RP[3] (Yes or No) | Maximum Projected Receiving Water Concentration ($C_d$)[2] | | | RP[3] (Yes or No) |
| | aquatic life acute | aquatic life chronic | recreation | | aquatic life acute | aquatic life chronic | recreation | |
| Arsenic, ug/l | 72 | 72 | 8.8 | No | 72 | 72 | 8.8 | No |
| Cadmium, ug/l | **13.9** | **13.4** | na | Yes | **14.3** | **13.8** | na | Yes |
| Chromium[1], ug/l | 1.99 | 1.95 | na | No | 2.0 | 2.0 | na | No |
| Copper, ug/l | **59.5** | **59.5** | na | Yes | **59.5** | **59.5** | na | Yes |
| Lead, ug/l | **59.7** | **59.7** | na | Yes | **66.2** | **66.2** | na | Yes |
| Mercury, ug/l | 0.189 | **0.22** | **0.22** | Yes | 0.19 | **0.22** | **0.23** | Yes |
| Nickel, ug/l | 36 | 36 | 4.0 | No | 36 | 36 | 4.0 | No |
| Silver, ug/l | **2.6** | na | na | Yes | **2.6** | na | na | Yes |
| Zinc, ug/l | **308** | **310** | na | Yes | **308** | **310** | na | Yes |
| WAD Cyanide, ug/l | **19** | **19** | 19 | Yes | **19** | **18** | 19 | Yes |
| WET, $TU_a$ for acute $TU_c$ for chronic | **0.48** | **4.8** | na | Yes | **0.48** | **4.8** | na | Yes |

na = not applicable (no criterion for comparison)

Footnotes:
1 - Chromium was assumed to be in the hexavalent form for comparison to the criteria for chromium-VI (the most stringent of the chromium criteria).
2 - The aquatic life maximum projected receiving water concentrations are expressed as dissolved for arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. All other metal concentrations in these columns are expressed as total.
3 - Reasonable potential (RP) exists if the maximum projected receiving water concentration exceeds the criteria (see Tables C-1 and C-2). The maximum projected receiving water concentrations in bold are those that exceed the criteria.

## III. Water Quality-Based Permit Limit (WQBEL) Derivation

Once EPA has determined that a WQBEL is required for a pollutant, the first step in developing the permit limit is development of a wasteload allocation (WLA) for the pollutant. The WLAs are then converted to long-term average (LTA) concentrations and compared. The most stringent LTA concentration for each parameter is converted to WQBELs. WLAs, LTAs, and WQBELs are derived based on guidance in the TSD. The determination of WLAs, LTAs, and WQBELs for the draft permit was presented in detail in Appendix B of the Fact Sheet. This section summarizes the Fact Sheet discussion and presents tables that provide the new WLA, LTA, and WQBEL values based on changes as a result of the response to comments and 401 certification.

Calculation of WLAs: The WLA is the concentration (or loading) of a pollutant that may be discharged without causing or contributing to an exceedence of water quality standards in the receiving water. WLAs are calculated using the same mass balance equation used in the reasonable potential evaluation (equations 1 and 2). However, $C_d$ becomes the criterion and $C_e$ the WLA. All of the other parameters are the same as defined in the previous section. Making these substitutions, Equation 1 is rearranged to solve for the WLA, becoming:

$$WLA = \frac{\text{criterion} \times [Q_e + (Q_u \times MZ)] - (C_u \times Q_u \times MZ)}{Q_e} \qquad \text{(Equation 4)}$$

For metals criteria expressed as dissolved, a translator is added to Equation 2 and the WLA is calculated as:

$$WLA = \frac{\text{criterion} \times [Q_e + (Q_u \times MZ)] - (C_u \times Q_u \times MZ)}{Q_e \times \text{translator}} \qquad \text{(Equation 5)}$$

Using the updated effluent and receiving water data, revised effluent flows, and new mixing zones, the WLAs were calculated for the parameters that exhibited reasonable potential.

Calculation of Long-term Average (LTA) Concentrations: As discussed in the Fact Sheet, WLAs are calculated for each criterion for each parameter. To allow for comparison (i.e., to determine which criteria results in the more stringent effluent limits), the WLAs are statistically converted to LTA concentrations. The following equations from Chapter 5 of the TSD are used to calculate the LTA concentrations:

$$LTA = WLA \times \exp[0.5\sigma^2 - z\sigma] \qquad \text{(Equation 6)}$$

where:

$\sigma^2 = \ln(CV^2 + 1)$ for acute aquatic life criteria
$= \ln(CV^2/4 + 1)$ for chronic aquatic life criteria
$CV$ = coefficient of variation
$z = 2.326$ for 99$^{th}$ percentile probability basis, per the TSD

Calculation of Effluent Limits: The LTA concentration is calculated for each criterion and compared. The most stringent LTA concentration is then used to develop the maximum daily and average monthly permit limits. The maximum daily and average monthly limits are calculated using the following equations from the TSD:

$$\text{maximum daily or average monthly limit} = \text{LTA} \times \exp[z\sigma - 0.5\sigma^2] \quad \text{(Equation 7)}$$

for the maximum daily limit:

$\sigma^2 = \ln(CV^2 + 1)$

z = 2.326 for 99th percentile probability basis, per the TSD

for the average monthly limit:

$\sigma^2 = \ln(CV^2/n + 1)$

n = number of sampling events required per month

z = 1.645 for 95th percentile probability basis, per the TSD

For setting water quality-based limits for protection of human health uses, the TSD recommends setting the average monthly limit equal to the WLA, and then calculating the maximum daily limit (i.e., no calculation of LTAs). The human health maximum daily limit is calculated based on the ratio of the average monthly limit/maximum daily limit as expressed by Equation 7.

WQBEL Summary: The average monthly and maximum daily WQBELs developed for each parameter that exhibited reasonable potential are shown in Tables C-6 and C-7. These tables also show intermediate calculations (i.e., WLAs, LTAs) used to derive the effluent limits. Section V. demonstrates the permit limit calculation for cadmium.

Table C-6: Summary of WQBEL Derivation for Outfall 002 at Jordan Creek Flows < 30 cfs

| Parameter[1] ug/l except as noted | Aquatic Life Criteria Wasteload Allocations (WLA) | | Aquatic Life Criteria Long Term Average (LTA) Concentrations | | Limits Based on Recreational Criteria | | WQBELs | | |
|---|---|---|---|---|---|---|---|---|---|
| | acute WLA | chronic WLA | acute LTA | chronic LTA | WLA = AML | MDL | Basis[2] | maximum daily limit | average monthly limit |
| Cadmium | 12.2 | 4.55 | 3.92 | 2.40 | na | na | chronic | 7.5 | 3.7 |
| Copper | 35.3 | 22.1 | 7.19 | 8.25 | na | na | acute | 35 | 14 |
| Lead | 29.6 | 11.5 | 95.2 | 6.09 | na | na | chronic | 19 | 9.5 |
| Mercury | 21.6 | 0.108 | 6.94 | 0.057 | 1.35 | 2.7 | chronic | 0.18 | 0.088 |
| Silver | 3.57 | na | 1.15 | na | na | na | acute | 3.6 | 1.8 |
| Zinc | 246 | 217 | 69.1 | 104 | na | na | acute | 250 | 110 |

Table C-6: Summary of WQBEL Derivation for Outfall 002 at Jordan Creek Flows < 30 cfs

| Parameter[1] ug/l except as noted | Aquatic Life Criteria Wasteload Allocations (WLA) | | Aquatic Life Criteria Long Term Average (LTA) Concentrations | | Limits Based on Recreational Criteria | | WQBELs | | |
|---|---|---|---|---|---|---|---|---|---|
| | acute WLA | chronic WLA | acute LTA | chronic LTA | WLA = AML | MDL | Basis[2] | maximum daily limit | average monthly limit |
| WAD Cyanide | 178 | 26.8 | 44.4 | 11.8 | 198,000 | 454,000 | chronic | 47 | 21 |
| WET, $TU_c$ | 27 | 9 | 6.72 | 3.96 | na | na | chronic | 16 | 9.8 |

na = not applicable (no criterion for comparison)

Footnotes:
1 - Parameters which exhibited reasonable potential (see Table C-4).
2 - Effluent limits based on the most stringent aquatic life criteria (lowest LTA) were compared to limits based on recreational uses. The most stringent of these represent the final WQBEL.

Table C-7: Summary of WQBEL Derivation for Outfall 002 at Jordan Creek Flows ≥ 30 cfs

| Parameter[1] ug/l except as noted | Aquatic Life Criteria Wasteload Allocations (WLA) | | Aquatic Life Criteria Long Term Average (LTA) Concentrations | | Limits Based on Recreational Criteria | | WQBELs | | |
|---|---|---|---|---|---|---|---|---|---|
| | acute WLA | chronic WLA | acute LTA | chronic LTA | WLA = AML | MDL | Basis[2] | maximum daily limit | average monthly limit |
| Cadmium | 5.74 | 2.68 | 1.84 | 1.41 | na | na | chronic | 4.4 | 2.2 |
| Copper | 14.0 | 8.08 | 2.86 | 3.01 | na | na | chronic | 14 | 5.6 |
| Lead | 126 | 4.9 | 40.4 | 3.0 | na | na | chronic | 8.1 | 4.0 |
| Mercury | 21.6 | 0.108 | 6.94 | 0.057 | 1.35 | 2.7 | chronic | 0.180 | 0.088 |
| Silver | 1.12 | na | 0.36 | na | na | na | acute | 1.1 | 0.60 |
| Zinc | 107 | 90.7 | 30.1 | 43.6 | na | na | acute | 110 | 50 |
| WAD Cyanide | 17.8 | 26.8 | 44.4 | 11.8 | 198,000 | 454,000 | chronic | 47 | 21 |
| WET, $TU_c$ | 27 | 9 | 6.72 | 3.96 | na | na | chronic | 16 | 9.8 |

na = not applicable (no criterion for comparison)

Footnotes:
1 - Parameters which exhibited reasonable potential (see Table C-4).
2 - Effluent limits based on the most stringent aquatic life criteria (lowest LTA) were compared to limits based on recreational uses. The most stringent of these represent the final WQBEL.

## IV. Summary of Final Permit Effluent Limitations

The previous sections discussed how the WQBELs were developed for the final permit. This section discusses how the WQBELs and technology-based effluent limits become the final effluent limits. This section only discusses the metals, cyanide, and WET effluent limits, since the effluent limits for TSS and pH are the same as in the draft permit.

As discussed in Appendix B of the Fact Sheet, technology-based limits are applied to each discharge and evaluated (via the reasonable potential evaluation) to determine whether these limits may result in any exceedence of water quality standards in the receiving water. The technology-based effluent limits applicable to Outfall 002 were presented in Table B-1 of the Fact Sheet. If the reasonable potential analysis demonstrates that discharge at the technology-based effluent limits could result in exceedences of water quality standards, then WQBELs are developed. The reasonable potential analysis, above, demonstrated that discharge at the technology-based effluent limit metals concentrations have the potential to cause or contribute to exceedence of water quality standards in the receiving water, therefore WQBELs were developed for cadmium, copper, lead, mercury, and zinc and are included in the final permit. WQBELs were also developed for silver and WET.

Following is a summary of how the final permit effluent limits compare with the draft permit effluent limits:

- Effluent limits for cadmium, copper, lead, silver, zinc, WAD cyanide, and WET increased in magnitude due to changes in the effluent flows (use of a dilution ratio) and mixing zones used in the final permit calculations.

- Effluent limits for chromium were removed from the permit since it no longer exhibits reasonable potential.

- The effluent limits for metals and cyanide in the draft permit were expressed in terms of both concentration (ug/l) and mass (lb/day). The draft permit mass-based limits were calculated by multiplying the concentration-based effluent limit by the maximum effluent flow. However, in the final permit, effluent limits were developed based on a dilution ratio, instead of the maximum effluent flow. Therefore, instead of controlling mass loading via mass loading limits calculated based on the maximum effluent flow, mass loading in the draft final permit is controlled via limiting the dilution ratio that used to calculate the effluent limits. The final permit requires that the dilution ratio must be greater than or equal to 8:1. See also response to Hecla comments 1 and 7.

## V. Example WQBEL Calculation

This section demonstrates how the water quality-based analysis (reasonable potential determination and development of effluent limits) was performed using cadmium as an example.

**Step 1: Determine the applicable water quality criteria.**

Applicable water quality criteria for cadmium are provided in Table C-2. The criteria applicable to low flow conditions (< 30 cfs in Jordan Creek) are:

aquatic life acute = 1.7 ug/l (expressed as dissolved)
aquatic life chronic = 0.61 ug/l (expressed as dissolved)

The criteria applicable to high flow conditions (> 30 cfs in Jordan Creek) are:

aquatic life acute = 0.82 ug/l (expressed as dissolved)
aquatic life chronic = 0.37 ug/l (expressed as dissolved)

**Step 2: Determine if there is reasonable potential for the discharge to exceed the criteria in the receiving water.**

To determine reasonable potential, the maximum projected receiving water concentration ($C_d$) is compared to the applicable water quality criterion. If $C_d$ exceeds the criterion, then reasonable potential exists and a WQBEL is established. Since the cadmium criteria is expressed as dissolved, $C_d$ is determined via Equation 2.

$$C_d = \frac{\text{translator} \times (C_e \times Q_e) + [C_u \times (Q_u \times MZ)]}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation 2)}$$

The parameters to substitute in the above equation are:

translator = the water quality criteria conversion factor is used as the translator. The conversion factors for cadmium are based on hardness and calculated according to the equations shown in Table C-2.

The hardness applicable to Outfall 002 under low flow conditions is 49 mg/l $CaCO_3$. The conversion factors based on this hardness are:

acute conversion factor = 1.136672 - (0.041838) ln (49) = 0.974
chronic conversion factor = 1.101672 - (0.041838) ln (49) = 0.939

The hardness applicable to Outfall 002 under high flow conditions is 25 mg/l $CaCO_3$. The conversion factors based on this hardness are:

acute conversion factor = 1.136672 - (0.041838) ln (25) = 1.00
chronic conversion factor = 1.101672 - (0.041838) ln (25) = 0.967

$C_e$ = maximum projected effluent concentration = 100 ug/l ($C_e$ is the same as in the draft permit calculations. See Appendix C of the Fact Sheet, page C-2).

$C_u$ = upstream receiving water concentration = 0 ug/l, dissolved (see Table C-3)

$Q_e$ = effluent flow = 0.15 cfs for low flow conditions (see page C-7)
= 3.75 cfs for high flow conditions

$Q_u$ = upstream receiving water flow = 1.2 cfs for low flow conditions (see page C-5)
= 30 cfs for high flow conditions

MZ = mixing zone = 0.75 (see page C-7)

Insert the above values into equation 2and solve:

For low flow condition (< 30 cfs in Jordan Creek):

Determine the reasonable potential to exceed the chronic criterion (solve equation 2):

$$C_{d,\ chronic} = \frac{(0.939)(100)(0.15) + (0)(1.2)(0.75)}{0.15 + (1.2)(0.75)} = 13.4 \text{ ug/l}$$

Since the maximum projected receiving water concentration ($C_d$ = 13.4 ug/l) exceeds the chronic aquatic life criterion (0.61 ug/l), there is reasonable potential for the effluent to cause an exceedence of the water quality standard, and a WQBEL is required (see Table C-5).

Determine the reasonable potential to exceed acute aquatic criterion:

$$C_{d,\ acute} = \frac{(0.974)(100)(0.15) + (0)(1.2)(0.75)}{0.15 + (1.2)(0.75)} = 13.9 \text{ ug/l}$$

Since the maximum projected receiving water concentration exceeds the acute aquatic life criterion (1.7 ug/l), there is reasonable potential for the effluent to cause an exceedence of the water quality standard, and a WQBEL is required (see Table C-5).

Perform the same calculations for the high flow condition (≥ 30 cfs in Jordan Creek):

Determine the reasonable potential to exceed the chronic criterion:

$$C_{d,\ chronic} = \frac{(0.967)(100)(3.75) + (0)(30)(0.75)}{3.75 + (30)(0.75)} = 13.8 \text{ ug/l}$$

The maximum projected receiving water concentration exceeds the chronic aquatic life criterion (0.37 ug/l) therefore, a WQBEL is required (see Table C-5).

Determine the reasonable potential to exceed acute aquatic criterion:

$$C_{d,\ acute} = \frac{(1.0)(100)(3.75) + (0)(30)(0.75)}{3.75 + (30)(0.75)} = 14.3 \text{ ug/l}$$

The maximum projected receiving water concentration exceeds the acute aquatic life criterion, therefore, a WQBEL is required (see Table C-5).

NOTE: If reasonable potential exists to exceed any one of the cadmium criteria, WQBELs are required.

**Step 3: Since there is reasonable potential, determine the wasteload allocations (WLAs):**

Since the applicable criteria are expressed as dissolved, the WLAs for cadmium are calculated using Equation 5:

$$WLA = \frac{\text{criterion} \times [Q_e + (Q_u \times MZ)] - (C_u \times Q_u \times MZ)}{Q_e \times \text{translator}} \qquad \text{(Equation 5)}$$

The variables in the WLA equation have already been defined in Steps 1 and 2. Plugging these into the above equation and solving.

For low flow conditions:
Determination of WLA for protection of chronic aquatic life (solve Equation 5):

$$WLA_{chronic} = \frac{(0.61)[0.15 + (1.2)(0.75)] - (0)(1.2)(0.75)}{0.15\ (0.939)} = 4.55 \text{ ug/l}$$

Determination of WLA for protection of acute aquatic life:

$$WLA_{acute} = \frac{(1.7)[0.15 + (1.2)(0.75)] - (0)(1.2)(0.75)}{0.15\ (0.974)} = 12.2 \text{ ug/l}$$

These WLAs are shown in Table C-6.

For high flow conditions:
Determination of WLA for protection of chronic aquatic life:

$$WLA_{chronic} = \frac{(0.37)[3.75 + (30)(0.75)] - (0)(30)(0.75)}{3.75\ (0.967)} = 2.68 \text{ ug/l}$$

Determination of WLA for protection of acute aquatic life:

$$WLA_{acute} = \frac{(0.82)[3.75 + (30)(0.75)] - (0)(30)(0.75)}{3.75\ (1)} = 2.68 \text{ ug/l}$$

These WLAs are shown in Table C-7.

**Step 4a: Develop Long-term Average Concentrations Based on the WLAs**.

Effluent limits are developed by converting the WLAs to long-term average concentrations (LTAs). The most stringent LTA is used to develop the effluent limits. The aquatic life WLAs are converted to LTAs using Equation 6:

$$LTA = WLA \times \exp[0.5\sigma^2 - z\sigma] \qquad \text{(Equation 6)}$$

where,

z = 2.326 for 99th percentile probability basis (per the TSD)
CV = 0.6 for cadmium (see Table C-3)

for acute criteria, $\sigma^2 = \ln(CV^2 + 1) = \ln(0.6^2 + 1) = 0.3075$
for chronic criteria, $\sigma^2 = \ln(CV^2/4 + 1) = \ln(0.6^2/4 + 1) = 0.0862$

Plug the above values and the WLAs from step 3 into equation 6 and solve:

For low flow conditions:

$$LTA_{chronic} = (4.55) \times \exp[0.5(0.0862) - (2.326)(0.2936)] = 2.40 \text{ ug/l}$$

$$LTA_{acute} = (12.2) \times \exp[0.5(0.3075) - (2.326)(0.5545)] = 3.92 \text{ ug/l}$$

These LTA concentrations are shown in Table C-6. Since the $LTA_{chronic}$ is more stringent than the $LTA_{acute}$, the $LTA_{chronic}$ is used to derive the aquatic life WQBELs (see step 4b, below).

For high flow conditions:

$LTA_{chronic}$ = (2.68) x exp [0.5(0.0862) - (2.326)(0.2936)] = 1.41 ug/l

$LTA_{acute}$ = (5.74) x exp [0.5(0.3075) - (2.326)(0.5545)] = 1.84 ug/l

These LTA concentrations are shown in Table C-7. Since the $LTA_{chronic}$ is more stringent than the $LTA_{acute}$, the $LTA_{chronic}$ is used to derive the aquatic life effluent limits (see step 4b, below).

**Step 4b: Develop Effluent Limits Based on the LTA.**

The most stringent LTA concentration for each flow condition is converted to a maximum daily limit and average monthly limit via Equation 7:

maximum daily, average monthly = LTA x $\exp[z\sigma-0.5\sigma^2]$ (Equation 7)

where,

for the maximum daily limit :
z = 2.326 for 99th percentile probability basis (per the TSD)
$\sigma^2 = \ln(CV^2 + 1) = \ln(0.6^2 + 1) = 0.3075$

for the average monthly limit:
z = 1.645 for 95th percentile probability basis (per the TSD)
$\sigma^2 = \ln(CV^2/n + 1) = \ln(0.6^2/4 + 1) = 0.0862$
since n = number of samples per month = 4 (weekly monitoring for cadmium),

Substituting the above values and the lowest LTA concentrations from Step 4a into equation 7 and solving:

For low flow conditions:

max. daily limit = (2.40) exp [(2.326)(0.5545) - 0.5 (0.3075)] = 7.5 ug/l
avg. monthly limit = (2.40) exp [(1.645)(0.294) - 0.5 (0.0862)] = 3.7 ug/l

For high flow conditions:

max. daily limit = (1.41) exp [(2.326)(0.5545) - 0.5 (0.3075)] = 4.4 ug/l
avg. monthly limit = (1.41) exp [(1.645)(0.294) - 0.5 (0.0862)] = 2.2 ug/l

These are the WQBELs for cadmium in the final permit (see Tables C-6 and C-7).

## VI. References

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control.* Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, D.C., March 1991. EPA 505/2-90-001.

EPA Region 10 1999. Fact Sheet for the Draft NPDES Permit for Hecla Mining Company Grouse Creek Unit, NPDES Permit No. ID-002646-8, EPA Region 10, Seattle, Washington. November 24, 1999.

Hecla 2001. Letter from Paul Glader, Hecla, to Patty McGrath, EPA, NPDES Permit No. ID-002646-8, Comments Regarding Draft Final NPDES Permit for the Grouse Creek unit, Biological Evaluation Package Dated February 6, 2001. Dated September 28, 2001.

IDEQ 2000. Idaho Department of Environmental Quality (IDEQ). Clarification of IDEQ CWA 401 Certification of NPDES Permit No. ID-002646-8 Hecla Mining Company, Grouse Creek Unit Outfall 002. Letter from James Johnston, Regional Administrator, IDEQ Idaho Falls Regional Office to Robert Robichaud, USEPA. October 3, 2000.

# APPENDIX D
# RESPONSE TO HECLA COMMENT 36

| Receiving Water Monitoring Parameters and MDLS | | | | | |
|---|---|---|---|---|---|
| Parameter | units | MDL from Table 2 of the draft permit (Table 3 of the final permit) | Current EPA-Approved Methods Can Achieve the MDL | | |
| | | | Method Number | Detector | MDL |
| Cadmium, dissolved | ug/l | 0.1 | 200.8[2] | ICP-MS | 0.03 (sims) |
| | | | 213.2[1] | GFAA | 0.1 |
| Copper, dissolved | ug/l | 1 | 200.8[2] | ICP-MS | 0.5 (scan) |
| | | | 220.2[1] | GFAA | 1 |
| Lead, dissolved | ug/l | 0.1 | 200.8[2] | ICP-MS | 0.05 (sims) |
| Mercury, total | ug/l | 0.0005 | 1631 Rev. B[1] | | 0.0005[3] |
| Selenium, total recoverable | ug/l | 2 | 270.2[1] | GFAA | 2 |
| | | | 270.3[1] | FAA | 2 |
| Silver, dissolved | ug/l | 0.1 | 200.8[2] | ICP-MS | 0.1 (scan) |
| Zinc, dissolved | ug/l | 10[4] | 200.7[1] | ICP | 2 |
| | | | 200.8[2] | ICP-MS | 1.8 (scan) |
| | | | 289.2[1] | GFAA | 0.05 |
| Cyanide, weak acid dissociable | ug/l | 2 | OIA-1677[1] | | 0.5 |
| Ammonia, total | mg/l | 1 | 350.1[1] | Phenate | 0.1[3] |
| | | | 350.2[1] | Nessler | 0.5[3] |
| | | | 350.2[1] | Titration | 1[3] |
| | | | 350.3[1] | ISE | 0.3[3] |
| Nitrate-Nitrite[5] | mg/l | 0.1 | 353.1[1] | CD/Hydra | 0.1[3] |
| | | | 353.2[1] | CD/Auto | 0.5[3] |
| | | | 353.3[1] | CD/Man | 0.1[3] |

Footnotes;
1 - EPA approved method.
2 - Not an EPA-approved (40 CFR 136) method, but can be approved by the Regional Administrator for use on a case-by-case basis when requested by the permittee (EPA 1992). SIMS is selected ion monitoring mass spectrometry and SCAN is when all metals are scanned for detection simultaneously.
3 - The method does not specify a MDL, therefore the published ML is specified.
4 - The zinc MDL was revised. See response to Hecla comment 36.
5 - Nitrate-Nitrite monitoring was added as a result of BWCC/ICL comment 1 and USFS comment 1.

## APPENDIX E

## FINAL NPDES PERMIT - SHADED/STRIKEOUT VERSION

This appendix contains a shaded-strikeout version of the final permit that demonstrates changes between the draft permit and the final permit. The additions to the permit are shaded and deletions are in strikeout.